AUTOMOTIVE INDUSTRIES

Founded 1895

Vol. 75, No. 18

October 31, 1936

This Week

This is the time of year when interest is strong on what the new season's cars are to be. In this issue the new De Soto is described on page 578. The 1937 Pontiac is shown with all of its new features on page 580, while on page 586 the Chrysler is described and the Cord on page 588.

This issue gives a fine opportunity to make comparisons between American and British models. On page 572 there is an account of the London Automobile Show with descriptions of all the principal makes in Great Britain.

Used Car Outlook Good

Present Stock of 440,000 Units Considered Normal And Dealers Better Prepared to Handle Trade-Ins

By Harold E. Gronseth

With 12 months' experience under the new plan, the automobile industry goes into the second year of new model introduction in the fall much less apprehensive of the used car situation than it was a year ago.

The changed-model year created new problems for factory and dealer and one of the most important of these was the necessity for disposing of a large number of used vehicles during an off season. Under the stimulus of fresh designs, the market readily absorbed new cars as fast as they were built but, lacking that incentive to buying, used car sales did not keep pace and inventories rose to a new autumn peak.

Sales managers were worried and dealers distressed at thoughts of carrying heavy stocks through a long winter. Special efforts were then directed toward moving the used cars. Factories helped. New merchandising techniques were developed. The reemployment of large numbers of men by industry boosted used car sales to higher levels than ever before in fall months. The combination of these factors saved the day and dealers muddled through.

Observers have reason to believe the situation this year will not be so tense. For one thing, everyone has learned from the experience of the past year. Dealers are expected to be more cautious in accepting trades. It is believed that they have learned the important lesson that trade-in values should be lower in the fall than in the spring when demand is naturally stronger; in other words, that allowances cannot be based on spring prices.

Dealers are being urged by the factories to go to work on their used car business simultaneously with new car offerings and not neglect that department as they did a year ago. Prompt reconditioning, adequate and attractive show space and the matching of shops with the size of the business are points that are being stressed. On the whole, a better merchandising job is expected to be done. With recovery still under way and men returning to work, good demand for used cars should continue. Slightly later new model announce-

(Turn to page 568, please)

Car Prices Discussed by AMA

But Directors Take No Action to Substitute Delivered Prices for F.O.B. in Advertising

No action was taken by A.M.A. directors in meeting Oct. 28 on the question of substituting delivered price for f.o.b. price in the industry's advertising. The subject was thoroughly discussed, but the association is not disposed to attempt to control selling policies of members. It was recognized that some may favor a change and others may not. There is even a difference of opinion between divisions of the larger companies. Whatever is done along this line would have to be done individually by members.

"The industry is studying carefully the question of factory list and delivered prices," said Alfred Reeves after the meeting. "For the present, the general belief among association members is that advertised delivered prices are not practicable because of the varying freight charges and taxes in the different states. The trend of thinking, however, is toward improving the advertising in such a way as to be acceptable to dealers and to avoid misunderstanding; in other words, advertising nationally a price which would include a standard package of accessories and to which dealers would add only freight and taxes. It was not considered advisable to bury the freight charges and taxes in the advertised prices, but to expose these items to the consumer's view."

Whatever steps are decided upon in this direction by individual members are not likely to be taken in the immediate future because all advertising copy in connection with new model announcements has been prepared and released to publications. It is not improbable, however, that in the course of the next model year a revision in the method of advertising car prices may be made under leadership of some major manufacturer.

Other business taken up at the directors' meeting was routine. A resolution was passed in connection with the death of A. J. Brosseau, president of Mack Truck and director of the A.M.A., but no one was elected to the vacancy on the board. A report was made on preparations for the safety luncheon to be held in New York Nov. 12 and on the New York Automobile Show.

Cord Supercharger Optional

Supercharger equipment will be optional on the Cord car, increasing the horsepower to 170, according to a late report. A new Berline model with 132-in. wheelbase will be added to the line of Cord bodies. (Further details of Auburn plans appear on page 562.)

New Auburn Next Year

Rear-Drive Car to Be Priced Lower Than Cord

By George Applegren

Pressed for a statement as to what the Auburn Automobile Co.'s plans are for 1937 for the Auburn and Cord cars, Roy H. Faulkner, president stated this week, that while there will be no appreciable changes in the Cord car, either from the standpoint of appearance or mechanical construction, there will be two important changes in the Auburn line.

The company's plans for next year have purposely been held back from public announcement pending removal of the offices from Auburn to Connorsville, where the factory and body plant are located.

No sales manager has been appointed to succeed R. S. Wiley, who resigned when the offices were moved from Auburn. It is definitely known, however, that Mr. Faulkner expects to give the major portion of his time to the sales end of the business and to developing the Auburn-Cord distributor and agency organization.

The Auburn Six is to be dropped entirely, it is learned. A new rear-drive car bearing the Auburn name-plate is in the course of development and will probably be announced shortly after the first of the year. This new car will be as individualistic in its field as the Cord is in its, according to Mr. Faulkner. It will be higher in price than the present Auburns, but will be priced lower than the Cord.

Mr. Faulkner's statement follows:

"With the trend toward a higher standard of living so pronounced, we feel that Auburn's place in the industry is to devote its facilities and experience exclusively to the creation of specialty merchandise. The Cord is the forerunner of this program, and it is our intention to present in this new Auburn individuality in styling and performance, and to make it stand apart in its price field in the same manner that the Cord stands apart in its field."

At the present time the Connorsville plant is producing Cord cars only. The production for 1936 is put in the neighborhood of 1800 units, approximately the production quota set at the start of the season.

Studebaker Profit for 9 Months Is $708,547

Paul G. Hoffman, president, reports that in the third quarter the Studebaker Corp. showed an operating loss of $296,283 compared with a loss of $1,104,923 in the third quarter last year. Net profit for the nine months of 1936 is $708,547, which compares with an operating loss of $1,192,760 between March 9 and Sept. 30, 1935.

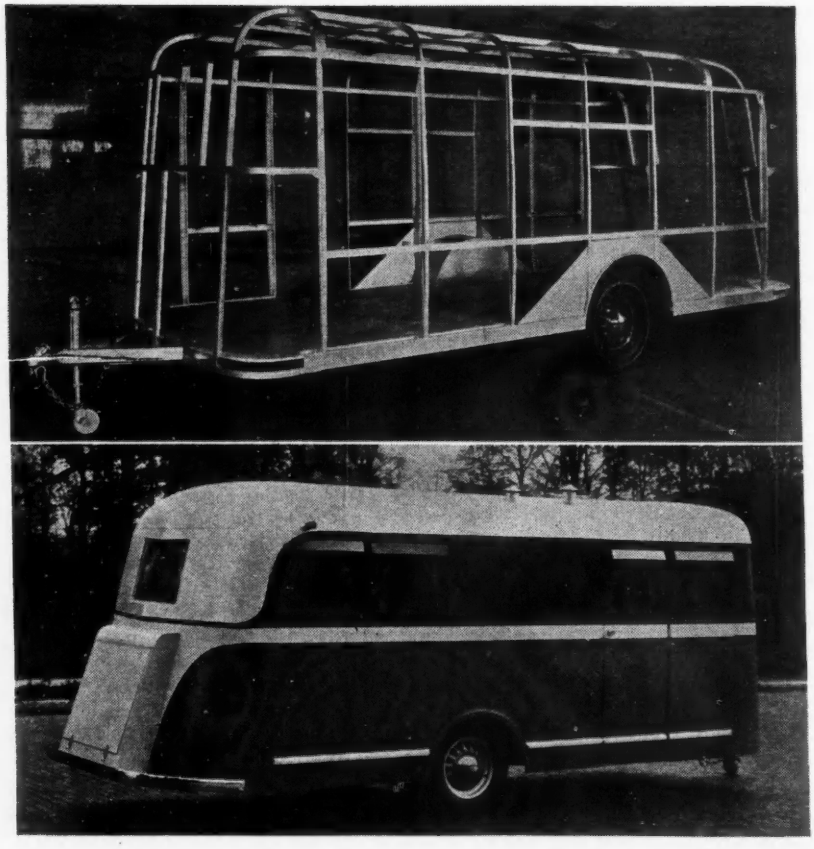
United Orders 8 More Douglas

United Air Lines let contracts for eight more Douglas twin-motored 12-ton sleeping planes Oct. 24, according to William A. Patterson, president, bringing the total commitments for this new flying equipment up to 28, the largest fleet additions of any transport line so far this year. The planes will be put in the air as fast as they are delivered.

Bender Builds "Travel Mansions"

Three Models of New Tourist Trailer Have All-Steel Bodies, Efficient Braking Systems

The Bender Body Co. of Cleveland, has begun production of its line of all-steel "Travel Mansion" tourist trailers. The three models will be exhibited at the New York, Chicago and Cleveland automobile shows.



The Bender tourist trailers are all-steel units with a frame made of special double strength hot rolled steel with cross channels. Panels of furniture steel riveted to posts and cross rails form the outer covering of the body. The interior is finished in lacquer. Seapack insulation and air pockets between the inner and outer panels provide insulation.

The Bender trailers are made in three lengths (inside dimensions): 14 ft.; 16 ft. 3¾ in.; and 18 ft. 6 in. The width of each model is 6 ft. 3 in. Each model accommodates four persons. The davenport at the front opens into a full size double bed as do also the dinette seats at the rear. All models are equipped with standard braking systems and there is an emergency brake which locks the wheels if the connection between the trailer and towing vehicle is broken.

The "Travel Mansions" have combination cabinet-wardrobes. Opening the first door which has a full-length mirror inside, a wardrobe is revealed. Behind the next door is a shower stall with curtain and a chemical closet may be pulled out from underneath shelves adjacent to the shower. The trailers are completely equipped with the usual essentials, such as sink, cabinets, stoves, refrigerator, water tank, etc.

A separate trailer division has been organized to build and market the "Travel Mansions." Design and production are under the direct supervision of Herman Bender, president. E. J. Speh, formerly with the White Motor Co., is sales manager.

The "Travel Mansion" tourist trailer built by the Bender Body Co. of Cleveland and (above) photo showing steel frame-work of the trailer.

Ford Dealers to Meet

New Models Will Be Announced To Huge Gathering Nov. 6

For the first time since the Ford Motor Co. was founded more than 33 years ago, Ford dealers from all parts of the United States and Canada will gather in Dearborn, Mich., next Friday Nov. 6, for a huge dealer meeting with Henry Ford, founder, and Edsel Ford, president, of the company. Present indications point to an attendance of approximately 7000 dealers.

The purpose of the meeting is the unveiling to the dealers of new Ford V-8 cars for 1937, but the climax will come when the dealers present to Henry Ford in historic old Greenfield Village the 300-year-old Cape Cod windmill, built by the pilgrims in 1633, once a landmark of the Four Corners at West Yarmouth, Mass. The windmill was purchased for Mr. Ford more than a year ago by a committee of dealers. It was carefully taken down, timber by timber, each numbered, and now has been re-erected in Greenfield Village.

An address of welcome by Edsel Ford, as president of the company, will open the meeting. Information on the new cars and plans for the forthcoming selling season will be presented by W. C. Cowling, director of sales, as well as by J. R. Davis, his assistant.

The highlight of the session will be the presentation of the new cars, which will be driven into the coliseum and around the arena. A presentation of the new car features, carried out with the aid of giant models, in a setting designed by Walter Dorwin Teague, industrial designer, will follow. The meeting will be adjourned at noon for luncheon which will be served at the dairy building in the state fair grounds.

First glimpse of the 1937 Willys was given journalists at the confidential preview of the new line at the factory in Toledo

GM Nets $175,198,624 in 9 Mos.

Third Quarter Earnings of $34,626,078 Are Best for That Period Since 1929

Net earnings of General Motors Corp. for the quarter ending Sept. 30 amounted to $34,626,078, which, after deduction of $2,294,555 for preferred stock dividends, equals 75 cents a share on the average number of shares of common stock outstanding during this quarter. This compares with earnings of $30,753,088 for the third quarter of 1935, or 66 cents a share. This is the largest profit earned by the corporation for the third quarter since 1929, when net profit was $79,266,639, equal to $1.58 per share.

For the nine months ended Sept. 30, 1936, net earnings applicable to the common stock amounted to $3.92 per share, or a total of $175,198,624, compared with profit of $2.51 per share, a total of $107,599,261 for the same period in 1935.

In the quarter ended June 30, last, net earnings of General Motors amounted to $88,108,372, equal to $2 per share. Stoppage of production in preparation for the 1937 models was responsible for the poorer showing in the third quarter.

Net earnings applicable to the common stock for the 12 months ended Sept. 30, 1936, were equivalent to $5.10 per share on the average common shares outstanding during this period. Total net profits during this period amounted to $227,942,208. After deducting dividends of $9,178,220 on the preferred stock, there remains $218,763,988 as the amount earned on the common shares.

"No provision has been made for the Federal surtax imposed by the Revenue Act of 1936 on any undistributed profits accruing after Jan. 1, 1936," according to the announcement made by Alfred P. Sloan, Jr., president of the corporation. Mr. Sloan's statement continues:

"Cash, United States Government and other marketable securities at Sept. 30, 1936, amounted to $284,397,262, compared with $219,802,942 at Sept. 30, 1935, and $199,435,663 at Dec. 31, 1935. Net working capital at Sept. 30, 1936, amounted to $336,636,390, compared with $314,135,092 at Sept. 30, 1935, and $319,961,219 at Dec. 31, 1935.

"Net sales of General Motors Corp., excluding inter-divisional transactions, for the third quarter ended Sept. 30, 1936, amounted to $261,233,445, compared with $236,641,933 for the third quarter of last year. Net sales for the nine months ended Sept. 30, 1936, amounted to $1,068,653,947, compared with $831,525,923 for the corresponding period of 1935.

"Net sales of General Motors Corp., excluding inter-divisional transactions, for the 12 months ended Sept. 30, 1936, amounted to $1,392,769,535."

Packard Dividend

20 Cents per Share Voted Is Third Payment This Year

Directors of Packard Motor Car Co. have declared a cash dividend of $3,000,000, or 20 cents a share, payable Dec. 15, 1936, to stockholders of record Nov. 10, 1936, bringing total dividends for the year to $6,750,000. In February of this year the company paid a dividend of $1,500,000, or 10 cents a share, and in July a dividend of $2,250,000, or 15 cents a share.

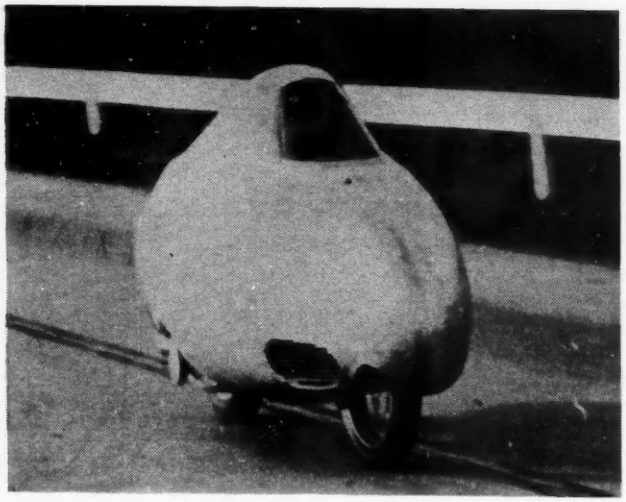
The company reports net earnings for the nine months ended Sept. 30, 1936, of $3,562,918.20, or 23 cents a share against $776,872.93, or 5 cents a share, earned in the corresponding period of 1935. For 1935, during which no dividends were paid, net earnings were $3,315,622.38. Net earnings for the third quarter of 1936, during half of which time the plant was practically shut down for model changes, were $42,790.51 against $486,413.39 for that period of 1935. Cash and securities as of Sept. 30, 1936, totaled $13,681,162.53, compared with $12,986,236.49 at the beginning of the year and $9,521,168.96 on Sept. 30, 1935.

Geschelin to Speak at Hartford

Joseph Geschelin, Detroit technical editor, AUTOMOTIVE INDUSTRIES, will address the Southern New England Section, SAE, at its meeting on Nov. 9 in Hartford, Conn. Although the major part of the talk will be devoted to an analysis of new car features for 1937, the discussion will also touch upon future trends in passenger car design. A feature of the presentation is to be a high-spotting of recent developments in machine shop practice with some reference to future trends in automotive manufacturing.

No Netherlands Show

As a protest against high automobile taxation, the automobile trade association of the Netherlands has decided not to hold the customary show in 1937.



More streamlining as applied to motorcycles. Ernst Henne, German motorcycle racer, will attempt to establish a new world's record with the machine pictured here. The motorcycle can be run at high speed only with following or headwinds, it is said, because of instability in cross-winds

Acme photo

:SLANTS:

FREIGHT CAR SHORTAGE—*Warning has been issued by J. S. Marvin, general traffic manager of the AMA, that automobile shipments out of Detroit and the neighboring territory until the end of the year will require 85,848 freight cars, according to reports submitted by the factories. During the same period, production at other plants throughout the country will require 61,245 more cars, making a total for the industry of 147,043 freight cars. As automobiles are now handled in cars equipped with special loading devices, of which there are less than 29,000 in service, automotive traffic men are concerned over the prospect of getting an adequate supply. "It will be necessary," said Mr. Marvin, "for the railroads to give close attention to the prompt movement and return of their cars to the factories without delay." Automobile dealers have been asked to see that they are unloaded with the greatest possible dispatch.*

SCHOOL HIGHWAY — *The first "safety educational highway" consists of a one-mile stretch of heavily traveled Route 8 north of Canton, Ohio. It was sponsored by the Ohio State Safety Council which intends to build 47 more of its kind in the state. A good surface, lines to divide slow and fast traffic and sodium lighting by night are features of the road. It is flanked on either side by 14 signs bearing safety messages and counsels for drivers.*

'ROUND THE WORLD — *Invitations to see the new Cadillac-LaSalle line were mailed by Claude Nolan, Jacksonville, Fla., distributor, on Oct. 8 to neighbors living only a few blocks away, but the letters will not arrive until Nov. 10, just in time for the new model display. Only 33 days to deliver these letters is really remarkably fast time, since they will have gone around the world. They caught the last trip of the Hindenburg, addressed to 550 individuals care of the American Express Co. in Hongkong, China. From Frankfort, the mail was sent by air to London and then was flown by Imperial Airways to the Chinese city. There, the stickers with temporary addresses were torn off, revealing the Jacksonville names, and except for the trip from Hongkong to Manila, the invitations, when they arrive, will have completed the circuit by air. Postage on each letter amounted to about $2.*

ON TIME—*Right at the minute scheduled, the Dodge "Three-Nation Goodwill Truck" pulled up in front of City Hall, Detroit, recently after having completed a tour of 5200 mi. from Mexico City to Washington and Ottawa, Canada, with stops at 35 cities en route. The truck carried at all times a load of more than two tons. It made the 4084 mi. from Mexico City to Ottawa in 108 hours driving time, averaging 37.7 m.p.h.*

"TAX DODGER"—*This is the highly appropriate name of the lowest-priced tourist trailer model made by the Caravan Trailer Co., Haverhill, Mass. It is priced complete at $425.*

New Motor Wheel Plant

Lansing Foundry Will Be Leased to Campbell Wyant

Motor Wheel Corp. will break ground immediately for a new foundry to be erected on its property in Lansing, Mich. Foundry buildings and melting equipment will be leased to the Campbell, Wyant and Cannon Foundry Co. of Muskegon, Mich., which will furnish and install the manufacturing equipment and operate the foundry exclusively for Motor Wheel.

It is expected that the foundry will be in operation early in January. Approximately $1,000,000 will be invested in buildings and equipment. When the foundry is in full operation, approximately 400 men will be employed. The new foundry buildings have been so laid out that future requirements can readily be cared for, and while in the beginning they will be used exclusively for the manufacture of centrifuse drums, there are possibilities of expansion to handle other requirements.

24 Trailers at Show

4 British Passenger Cars Listed at Grand Central Palace

Two new English cars have been added to the list of exhibitors for the National Automobile Show which opens Nov. 11, in Grand Central Palace, New York. This makes four British entries to compete with the 22 American makes displayed. The new arrivals are the Acedes and the Lagonda, entered by English Motors, Ltd., 21 East Fifty-seventh Street, New York. The other two foreign cars are the Austin and M. G. As for the trailer section of the show, the list of exhibitors now numbers 24 makes.

No show of recent years has attracted so much foreign attention as this season's exhibit. Three major delegations will arrive from abroad. The Reich Association of German Motor Vehicle Dealers and Manufacturers were scheduled to sail for their second study tour of the American automotive industry. A Swedish delegation under the leadership of the Swedish *Motor Journal* will arrive within a few days. They will be accompanied by the editor of the Swedish *Motor Journal* and C. G. Faxe, who was one of the first importers of cars into Sweden. A group from France will arrive in time for the show, while numerous prominent automotive people from other countries, including England and Switzerland, are expected. Victor Englebert, general manager of the N.V.H. Englebert Automobiel Handel, a prominent distributor of American cars in Holland, and active in motor circles there, has already arrived in New York. The groups will visit Detroit, Akron, Flint and other cities, and have arranged to be present for the International Day program, Nov. 16, at the automobile show.

Special days have been planned for the show period, as follows: Wednesday, Nov. 11, Opening Day; Thursday, Nov. 12, Safety Day; Friday, Nov. 13, Trailer Day; Saturday, Nov. 14, Football Day; Sunday, Nov. 15 (show open but no special program designated); Monday, Nov. 16, International Day; Tuesday, Nov. 17, Women's Day; Wednesday, Nov. 18, Closing Day.

1937 Dodge Prices

	1937	1936	Change
Business coupe	$640	$640	....
Coupe, rumble seat	695	695	....
Sedan, 2d	705	695	+10
Sedan, 2d, trunk	715	720	— 5
Sedan, 4d, trunk	755	760	— 5
Sedan, 4d	745	735	+10

Truck Bids Rejected

Offers Under $10,000 Limit Are Thrown Out by Treasury

That rigid enforcement of the Walsh-Healey Government Contracts Act is contemplated was evidenced Oct. 23 when the Procurement Division of the Treasury Department rejected "split bids" on 28 motor trucks for the Rural Resettlement Administration. The division immediately readvertised for bids to be opened on Nov. 6, which, to be considered, must be on an "all or none" basis. Meanwhile bids on another lot of motor trucks will be opened by the Procurement Division Nov. 2.

Except for one bidder who submitted a figure for all of the 28 trucks, the bidders submitted figures only on a portion of the total, each bid involving less than $10,000. The act does not apply to bids of $10,000 or less. The figure of the bidder who bid on all 28 trucks exceeded the money available and for this reason his tender was also rejected.

The rejection of the bids marked the first of many obstacles that it is expected will develop under the Walsh-Healey Act. There are reports that already contractors who have in the past bid on Government business may withdraw entirely from that field rather than be compelled to adhere to its provisions. It requires that Government supplies be produced by labor operating on a maximum of eight hours a day and 40 hours a week, with pay at the rate of time and one-half for overtime. Much interest is being shown in the next set of bids on motor trucks that may be submitted.

The Japanese Minister of Commerce and Industry, Dr. Ogawa (in white), examines an installation of a charcoal gas generator to a Tokyo taxi. The Japanese government is encouraging the use of charcoal gas generators on all types of public vehicles

Yellow Has 300 Orders For New Light Coaches

Yellow Truck & Coach Mfg. Co. reports orders on hand for over 300 of its new 21-passenger Model 733 coaches from 29 operating companies. This is the latest city service coach developed by Yellow and is designed primarily for lean revenue lines. It features an aluminum body, oversize four-wheel hydraulic brakes with booster, a completely paneled interior insulated against heat and cold, and a total weight of only 6500 lb.

During the first nine months of 1936 a total of 1502 Yellow coaches were delivered. October schedules call for delivery of 340 more, so by the end of the month the company will have passed the mark of 1553 deliveries, which was the total for 1935 and an all-time record for any manufacturer. New orders are reported to be coming in with regularity.

Passenger Car Production by Wholesale Price Classes

(U. S. and Canada)

First Nine Months 1936 and 1935 Compared

	1936	1935	Per Cent Change	Per Cent of Total 1936	Per Cent of Total 1935
$500 and under	1,573,301	1,492,165	+ 5.4	55.83	60.51
$501-$750	1,120,694	876,175	+28.0	39.77	35.53
$751-$1000	85,535	69,561	+23.0	3.03	2.82
$1001-$1500	27,512	16,455	+67.1	.98	.6¢
$1501-$2000	7,495	6,218	+20.6	.27	.25
$2001-$3000	3,194	3,643	—12.4	.11	.15
$3001 and over	257	1,958	—87.0	.01	.08
Total	2,817,988	2,466,175	+14.1	100.00	100.00

Truck Production by Capacities

(U. S. and Canada)

First Nine Months 1936 and 1935 Compared

	1936	1935	Per Cent Change	Per Cent of Total 1936	Per Cent of Total 1935
1½ tons and less	601,545	511,791	+17.6	93.40	93.66
2 to 3 tons	30,438	26,544	+14.9	4.73	4.85
3½ tons and over	6,217	4,565	+36.2	.96	.84
Special and buses	5,846	3,553	+64.8	.91	.65
Total	644,046	546,453	+17.9	100.00	100.00

1937 Terraplane Prices

	1937	1936	Ch'ge
DeLuxe			
Bus. coupe	$595	$595	$....
Coupe 3-pass.	605	...	....
Brougham	625	615	+10
Tour. Brougham	645	635	+10
Victoria	650	...	....
Sedan	675	670	+ 5
Tour. Sedan	695	690	+ 5
Super			
Coupe, 3-pass.	660	650	+10
Brougham	680	665	+15
Tour. Brougham	700	685	+15
Victoria	700	...	....
Sedan	725	720	+ 5
Tour. Sedan	745	740	+ 5

1937 Hudson Prices

	1937	1936	Ch'ge
Custom 6			
Bus. coupe	$695	$...	$....
Coupe, 3-pass.	720	710	+10
Brougham	740	730	+10
Tour. Brougham	765	755	+10
Victoria coupe	765	755	+10
Tour. Sedan	815	810	+ 5
Sedan	790	785	+ 5
DeLuxe 8—122-in. w.b.			
Coupe, 3-pass.	770	760	+10
Brougham	800	790	+10
Victoria coupe	820	810	+10
Tour. Brougham	825	815	+10
Sedan	840	830	+10
Tour. Sedan	865	855	+10
Custom 8—122-in. w.b.			
Coupe, 3-pass.	855	840	+10
Brougham	895	885	+10
Victoria coupe	905	895	+10
Tour. Brougham	920	910	+10
Sedan	940	925	+15
Tour. sedan	965	950	+15
DeLuxe 8—129-in. w.b.			
Sedan	865	855	+10
Tour. sedan	890	880	+10
Custom 8—129-in. w.b.			
Sedan	965	...	....
Tour. sedan	990	975	+15

1937 DeSoto Prices

Bus. Coupe	$685
Rumble Seat Coupe	735
2-door Brougham	745
2-door touring Brougham	755
4-door sedan	785
4-door tour. sedan	795

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES

General business activity continued to improve last week for the fifth successive week, and one weekly business index reached a new high for the current movement. Retail sales were higher, and heavy Christmas buying is expected. Wholesale business is estimated from 16 to 20 per cent above that in the corresponding period last year.

Guaranty Index Higher

The Guaranty Trust Co.'s index of business activity for September stands at the preliminary figure of 87.6, as compared with 86.7 the month before and 71.7 a year ago. The company's index of wholesale commodity prices on Oct. 15 was 59.0, as against 59.7 a month earlier and 56.7 a year earlier.

Carloadings Hold Gains

Railway freight loadings during the week ended Oct. 17 totaled 826,155 cars, which marks an increase of 5960 cars above those in the preceding week, a gain of 93,851 cars above those a year ago, and a rise of 185,428 cars above those two years ago.

Insurance Business Better

Sales of life insurance during September were three per cent above those last year, while sales during the first nine months of this year were five per cent below those in the corresponding period last year. In general, sales throughout western sections of the country have been better than in the East.

Lumber Orders Above Output

Production of lumber during the week ended Oct. 10 were 70 per cent of the 1929 weekly average. Shipments were slightly below the year's peak level in the two weeks preceding. New orders exceeded output for the first time in five weeks.

Power Output Steady

Production of electricity by the electric light and power industry in the United States during the week ended Oct. 17 was moderately above that in the preceding week and was 16.5 per cent above that in the corresponding period last year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended Oct. 24 stood at 84.0, as compared with 83.8 for both the week and two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Oct. 21 shows a decline of $2,000,000 in holdings of discounted bills. Bills bought in the open market and government securities remained unchanged. Money in circulation declined $5,000,000, and the monetary gold stock increased $5,000,000.

Toyoda Streamlined

New Japanese Car Closely Resembles U. S. Product in Design

The Toyoda Automobile Co. is the first Japanese firm to build an automobile of the much-discussed "Ford-Chevrolet" class. It is a six-seater on a 112-in. wheelbase. The standard sedan model, recently shown for the first time, and with an annual production of 6000 units scheduled, is well streamlined and has an all-steel body with steel roof—a novelty which has just been introduced into Japan through the Ford and G.M. plants.

The car has semi-elliptic springs of silico-manganese steel. Monroe double-acting hydraulic shock absorbers are fitted. The rear axle is of the semi-floating type. The car is equipped with a six-cylinder, water-cooled, valve-in-head engine of 3 5/16-in. bore and 4-in. stroke (206.8 cu. in. displacement) which is rated 65 hp. at 3000 r.p.m. It is substantially identical with the engine which has been used in Toyoda trucks and buses heretofore. The compression ratio is 5.42. Despite its considerable weight (680 lb. for the complete powerplant) it is placed in an extreme forward position, squarely over the front axle, in order to increase the passenger space. The engine has three main bearings and three-point support. Between the engine and the three-speed-and-reverse transmission there is a single-plate clutch. Engine lubrication is partly by splash and partly by force feed.

Service brakes are internal and hydraulically operated, while the emergency brakes are external and mechanically actuated. The manufacturer in his literature particularly stresses the fuel economy, claiming 40 km. per gal. of gasoline (probably the Imperial gallon.

National Battery Manufacturers Elect Officers and Directors

The following officers and directors for the ensuing year were elected recently at the 12th Annual Convention of the National Battery Manufacturers Association, held at the Hotel Sherman in Chicago:

L. B. F. Raycroft, the Electric Storage Battery Co., Philadelphia, Pa., president; L. N. Talkes, Cleveland Storage Battery Co., Cleveland, O., first vice-president; R. T. Pierson, USL Battery Corp., Niagara Falls, N. Y., second vice-president; E. T. Foote, Globe-Union, Inc., Milwaukee, Wis., secretary; L. A. Doughty, Carlile & Doughty, Inc., Conshohocken, Pa., treasurer; and William A. Baker, Firestone Steel Products Co., Akron, O.; G. W. Douglas, Douglas Battery Mfg. Co., Winston-Salem, N. C.; F. C. Kroeger, Delco-Remy Corp., Anderson, Ind.; B. F. Morris, Emark Battery Division, Thos. A. Edison, Inc., Kearny, N. J.; R. D. Mowry, Universal Battery Co., Chicago, Ill.; and S. W. Rolph, Willard Storage Battery Co., Cleveland, O., directors.

F. E. Spooner

F. Edward Spooner, champion bicycle rider of the 'nineties and later a pioneer of early automobile days, died at Hawthorne, N. Y., Oct. 25, at the age of 68 years.

Mr. Spooner in 1892 held every bicycle racing record from 25 to 375 miles. As a member of the firm of Spooner and Wells, commercial photographers specializing in automobile work during the early days of the industry, Mr. Spooner came into contact with all the pioneers of the industry. He participated in early motor tours, such as the New York to Florida run, the "Mudlark Tour" from New York to Pittsburgh, and a trip from Denver to Mexico City over country where few roads then existed.

Mr. Spooner was one of the founders of *Motor West*, a Los Angeles publication, and was for many years a vice-president and advertising manager of this Los Angeles publication. His widow, a son, F. Eugene Spooner, managing editor of *Distribution and Warehousing*, and a daughter, Mrs. Donald Craig, survive.

40 Years Ago

with the ancestors of AUTOMOTIVE INDUSTRIES

P. F. Olds and Son, Lansing, Mich., well-known manufacturers of gasoline engines, who have been engaged on a motor carriage for some months, write that they have finally reduced their ideas to tangible shape and find the results quite satisfactory. . . . Underneath the box (behind the seat) and in every way independent of it, is a 5 hp. gasoline motor which in operation scarcely makes any vibration.

The vehicle is steered with the left hand. . . . The machinery is said to be very simple, not even a countershaft being used in its construction. The carriage is fitted with 1½ in. rubber tires and is ball-bearing throughout.

The inventor is R. E. Olds, general manager of the company.

—From *The Horseless Age*, Oct., 1896.

Long Mfg. Activities Now Grouped in One Building

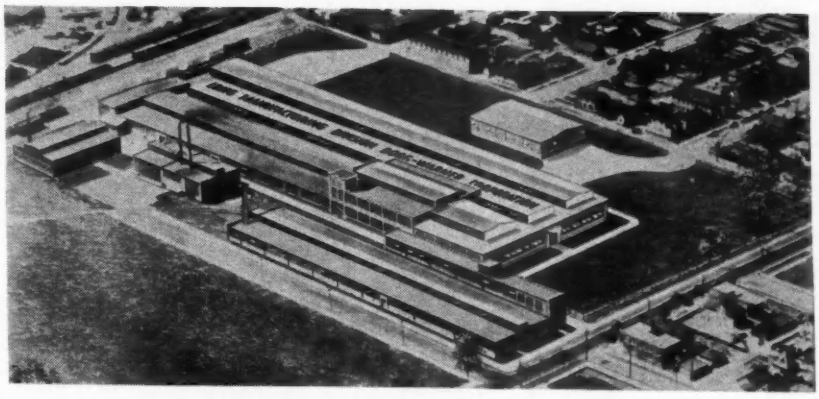
The Long manufacturing division of Borg-Warner Corp. has consolidated all its automotive clutch and radiator activities at its plant at Dequindre and Halleck Streets, Detroit. Since 1912, Long radiators had been manufactured at a plant on East Grand Boulevard, Detroit, but with extensive additions now completed at the Dequindre Street location, all production is now concentrated there.

A new addition, 128 ft. by 700 ft. has been added to the factory housing clutch production, with no divisional wall, providing a plant 256 ft. wide by 700 ft. long, or giving approximately 180,000 sq. ft. of factory space. This centralization of operations gives a total of 236,000 sq. ft. of space, including the area devoted to service parts production.

Much new equipment has been installed, and a new system of production has been placed in operation, providing for a "streamlined" method of manufacture, right from the receiving department, through the production lines, to the shipping department, with no back-tracking.

The rearrangement of facilities provides for production of 3600 radiators and 12,000 clutches per 24-hour day.

In revamping the plant, the general offices of the Long manufacturing division have also been brought under this one roof. Complete employee facilities have been provided, including a large lunch room with many improvements. The company has completed its moving and is now performing all manufacturing operations in the new plant.



New plant of the Long manufacturing division, Borg-Warner Corp., in Detroit, where all automotive clutch and radiator activities are now concentrated

Trailer Manufacturers to Meet in Chicago Nov. 19

Tourist trailer manufacturers from all parts of the United States and Canada will gather in Chicago at the convention of the Trailer Coach Manufacturers Association Nov. 19 and 20. All firms regularly engaged in the manufacture of trailer coaches have been invited to send an official representative.

Matters of general interest to be discussed are: national highway legislation, ethics and standards, financing, insurance and marketing.

General Motors Consolidates Subsidiary Sales Companies

Alfred P. Sloan, Jr., president, General Motors Corp., has made the following announcement:

"For the purpose of accomplishing important savings, as well as to simplify the corporation's corporate organization, certain subsidiary companies which heretofore have sold certain individual products as their sole function, will be dissolved and their activities grouped together in one corporate entity, which has been organized for the purpose, and styled — General Motors Sales Corp. The specific selling activities, formerly handled by each such separate sales company, will hereafter be handled by correspondingly designated divisions of General Motors Sales Corp."

In the past, every division that did business with the public had its own sales company, and this required individual registration with Secretary of States' offices for each company. Officers of the division and its corresponding sales company in every case were the same and will continue that way, except that instead of being a separate sales company it becomes a division of the General Motors Sales Corp., just as the manufacturing concern was a division of the General Motors Corp.

This simplification of corporate structure will have no effect whatsoever on the corporation's operating routine. The jurisdictions will be exactly as before. The personnel is in no way affected. Everything continues exactly as before except under a different corporate name.

3 SAE Sections Join For Newark Meeting

The regional transportation and maintenance meeting of the SAE to be held in conjunction with the Third Annual Truck and Accessory Show at Newark, Nov. 3-7, will be jointly sponsored by the Metropolitan, Southern New England and Philadelphia Sections of the society, the New Jersey Motor Truck Association, the Newark Chamber of Commerce and the New Jersey Highway Users Conference.

The program of the SAE meetings follows:

Wednesday afternoon, Nov. 4: "The Social Security Act and How It Will Affect Truck Operators and Their Families," by W. L. Dill, regional director, Social Security Board; "Tariffs," by Griswold B. Holman, manager, George B. Holman & Co., Inc.; chairman, Robert Jackson.

Wednesday evening: "Engineering Developments of 1937," by Austin Wolfe; chairman, H. K. La Rowe; discussers, Herbert Chase and Harold Blanchard.

Thursday afternoon, Nov. 5: "Some Recent Observations on American and European Diesels," by A. J. Blackwood, research engineer, Standard Oil Development Co.; "Diesel Engines in Highway Transport" and "Modern Practice and Latest Innovations Appearing in America and Europe," by Martin Schreiber, general manager in charge of plant, Public Service Co-ordinated Transport; joint chairman, L. M. De Turk and T. S. Johnson; discusser, Guy W. Wilson, engineer, General Electric Co. Mr. Wilson will give an illustrated talk on the subject: "Why the Electric Drive is Particularly Adapted to, and Practically Necessary with a Diesel—What Developments Have Reduced Weight and Cost of Electric Drive to Economical Basis."

Thursday evening: National Motor Truck Show banquet at 7 p. m., with addresses by Ted V. Rogers, president, American Trucking Associations, Inc.; Jack Garrett Scott, chief, Section of Law and Enforcement, Bureau of Motor Carriers, Interstate Commerce Commission; John F. Winchester, president, N. J. Motor Truck Association.

15% Gain for 9 Months

Passenger Car and Truck Production—U. S. and Canada

	September, 1936	August, 1936	September, 1935	First Nine Months 1936	First Nine Months 1935
Passenger Cars—U. S. and Canada:					
Domestic Market—U. S.	83,899	200,831	49,905	2,570,009	2,210,700
Foreign Market—U. S.	6,698	8,923	6,192	147,891	148,298
Canada	2,481	3,051	3,402	100,088	107,177
Total	93,078	212,805	59,499	2,817,988	2,466,175
Trucks—U. S. and Canada:					
Domestic Market—U. S.	37,892	52,784	25,026	522,267	425,653
Foreign Market—U. S.	6,641	8,753	6,417	96,129	90,653
Canada	2,174	1,609	1,786	25,650	30,147
Total	46,707	63,146	33,229	644,046	546,453
Total—Domestic Market—U. S.	121,791	253,615	74,931	3,092,276	2,636,353
Total—Foreign Market—U. S.	13,339	17,676	12,609	244,020	238,951
Total—Canada	4,655	4,660	5,188	125,738	137,324
Total—Cars and Trucks—U. S. and Canada	139,785	275,951	92,728	3,462,034	3,012,628

Exciters and Pick-Ups for Vibration Studies

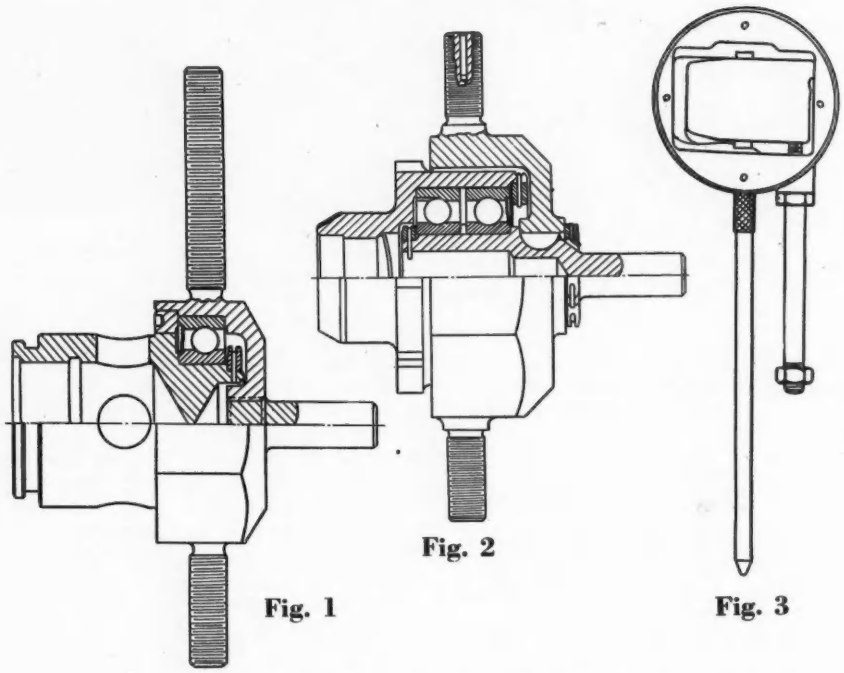


Fig. 1

Fig. 2

Fig. 3

We reproduce herewith three of the illustrations from the S.A.E. paper by John M. Tyler of Lycoming, of which an abstract appeared in our Oct. 24 issue. Fig. 1 shows a low-frequency exciter. The part at the left is the propeller nut. Vibrations of the engine are excited by rotating the right-hand part by means of an electric motor, etc. This part is unbalanced and the degree of its unbalance can be varied at will. Fig. 2 shows a similar exciter, but designed for operation at high speed. Fig. 3 shows a vibration pick-up developed by Westinghouse. It comprises a floating magnet and a light coil which, when the device is in use, accurately follows the vibrations of the part studied.

Los Angeles Raceway Opening on March 28

The new Los Angeles Raceway will open the 1937 campaign March 28, 1937, according to an announcement by the Contest Board of the American Automobile Association. Its opening race, originally scheduled for Nov. 29, was postponed because of a change in site of the track. Ground will be broken early next month on a 430-acre field on Ceritas Boulevard, adjacent to the Los Angeles Long Beach airport between Los Angeles and Long Beach.

The Roosevelt Raceway at Westbury, L. I., has been granted Labor Day, Sept. 6, on the international calendar of important racing events for 1937, it is announced by the AAA Contest Board. Labor Day will take the place of Columbus Day for the 400-mile International Sweepstakes next year. In addition to the Labor Day contest, the Raceway is already making plans for a Pan-American Sweepstakes next July 4. This event, present arrangements indicate, will be restricted to entrants from the American continents.

Used Car Outlook Good

(Continued from page 561)

ments and automobile shows mean a later start in accumulation of inventories that should lighten the carry-over for the winter. These are some of the reasons why sales executives are not especially worried this year although they are keeping a watchful eye on the situation.

Current used car stocks of dealers at the end of September were estimated at some 440,000 units, slightly higher than a year ago, but sales are also better so that in a number of days supply the industry is as well or better off. After all, the relation of stocks to turnover is what matters.

New car stocks on Sept. 30 were at the year's low point, estimated at 178,000 units or 21 per cent in excess of a year ago. The two periods are not exactly comparable because of the slightly later new car program this year which kept some of the major companies in production longer on outgoing models.

Oil Marketers Meet

Threat from Cooperatives and "Iowa Plan" Discussed

More than 1200 oil and gasoline jobbers and wholesalers attended the annual convention of the National Oil Marketers' Association held in Chicago this week. Among the subjects discussed were price stabilization, conservation, monopoly, consumer co-operatives, anti-trust laws and their application to the independent oil dealer, reviewal of the "Iowa Plan," where large companies are following the practice of leasing stations to operators, and the need of improved and advanced merchandising methods.

A literal bombshell was thrown into the convention by Harry Curran Wilbur, whose vigorous attack on consumer cooperatives described them as the oil industry's greatest enemy. He said that of the 18,000 consumer cooperatives in the United States, 56 per cent of them are in the oil business. "They have a membership of more than 3,000,000 persons, and do an annual volume in excess of $50,000,000," said Mr. Wilbur.

The "Iowa Plan," by which companies lease stations to operators as a means of escape from the heavy chain store tax imposed by the Iowa legislature, is so important that the convention set aside all of Wednesday afternoon for its discussion.

The subject was treated by three speakers. "How the 'Iowa Plan' Started," was told by Henry E. Wormhoudt, vice-president of the Cushman-Wilson Oil Co. of Des Moines. E. L. Barringer of the editorial staff of *National Petroleum News*, told "How the 'Iowa Plan' Came Into General Operation," and "How the 'Iowa Plan' Is Working Out" was explained by Charles Rohr of the Log Cabin Oil Co., Mason City, Ia.

That the plan is a success so far as it has been tried was the unanimous opinion of all three speakers. They told that operators to whom the stations have been leased have endeavored to improve their merchandising methods, have sought to increase their volume by promotion methods, and that in general it has worked out to the greater advantage of both operators and oil companies.

The following officers were reelected by the association: President, M. B. Whiting, Whiting Oil Co., Clifton Forge, Va.; vice-president, Roy R. Fisher, Argo Oil Cos., Detroit, Mich., and secretary-treasurer, Paul E. Hadlick, Washington, D. C. Fourteen of the 18 directors were reelected for one-year terms.

Nash-Kelvinator Merger Approved

Plan for Exchange of Stock to Be Submitted to Stockholders at Early Date

A plan for the merger of Kelvinator Corp. and the Nash Motors Co. has been adopted by directors of Kelvinator Corp. at a meeting held in Detroit and by directors of Nash Motors at a meeting in Chicago and will be submitted to shareholders of both companies as soon as necessary legal papers can be prepared, according to George W. Mason, president of Kelvinator.

The plan provides that the authorized capital stock of Nash Motors shall be increased in an amount sufficient to assure 1⅜ shares for each share of stock of Kelvinator Corp. The number of shares of stock held by stockholders of Nash Motors will remain unchanged.

Charles W. Nash, chairman of the board of Nash Motors, will become chairman of the new company and George W. Mason, chairman and president of Kelvinator, will head the new company as president. The new company will have a capitalization of 4,320,643 shares based on the share exchange as set out in the plan. Nash Motors has 2,730,000 no-par shares of capital stock outstanding and will require an additional 1,590,000 shares to exchange for Kelvinator's 1,156,831.

Commenting on the merger, Mr. Mason said: "To be associated with C. W. Nash, the dean of the motor industry, a man who has been responsible to a great extent for the growth and development of that industry and who today retains his outstanding place in the motor industry, is a privilege not only to me but to all the members of the Kelvinator Corp., and should also be a real advantage to Kelvinator stockholders.

"It is natural, in view of the sound growing trend toward diversification in industry, that this union should take place. It is in line with other mergers of automotive and air-conditioning organizations with which the public is already familiar.

"I am confident that, in addition to benefits which will accrue to the shareholders of the two companies, the union will be definitely advantageous to the Kelvinator staff, to its distributors and dealers and to the general public."

C. W. Nash, in a statement today commenting on the proposed merger of Nash Motors Co. and Kelvinator Corp., said: "As the founder of Nash Motors, and for 17 years its president, the prospects of forming a corporate alliance with Kelvinator Corp. is extremely gratifying. Kelvinator is a vital, dynamic organization, presided over by George Mason, one of the ablest executives that I know, a man who has made an enviable record in both the refrigerative and automotive fields.

"For, from a broad business standpoint, the training and the experience of the personnel of Kelvinator should be valuable in making the union one of great benefit to our dealer and distributor organization, to the shareholders, to the product and to the public. The benefits to Nash are considerable, not only in terms of management, but also in terms of actual savings to the combined businesses. With the united purchasing power of the two companies, substantial economies may be effected, and the respective research staffs undoubtedly will supplement each other in many directions. One thing I cannot stress too strongly, and that is that neither company is at present overstaffed, and this corporate union will not affect the relations of either company with its own personnel, distributors or dealers."

FRANK M. WHITE, president of the Burd Piston Ring Co. and the Liberty Foundries Co., of Rockford, Ill., has been selected as a candidate in the November election for trusteeship of the University of Illinois. Mr. White is a past president and secretary of the American Society of Agricultural Engineers and a former member of the SAE.

HENRY M. HOBART, for the past 25 years a consulting engineer with the General Electric Co. at Schenectady, has been presented with the Samuel Wylie Miller Memorial Medal by the American Welding Society in recognition of his outstanding service in the advancement of welding research.

S. R. THOMAS has been appointed manager of the automotive bearing division of the Bantam Ball Bearing Co., South Bend. For the past four years Mr. Thomas has been with Cord, Auburn and Dusenberg, his last position there having been that of chief engineer.

CARL W. FLOSS has severed his connection as design engineer with the Hoffman Motor Developments Co. and is now engaged in independent research work with offices at 637 Buhl Bldg., Detroit.

WILLIAM C. HUNT, for the past four years connected with the Campbell-Ewald Co. and D. P. Brother & Co., Inc., has joined the staff of Brooke, Smith & French, Inc., advertising agency. Mr. Hunt has been connected with Hudson, Chrysler and Packard.

DOUGLAS VAN PATTEN, chief engineer in charge of all technical activities of the Eddy Marine Corp., has resigned. For the past five years he was associated with the company and invented and designed the Eddy Aqua-Flow Powerboat.

THOR M. OLSON has been appointed sales manager of the Ex-Cell-O Aircraft & Tool Corp., Detroit, succeeding William F. Wise. Mr. Olson was general manager of the Continental Tool Works from the time of its founding until shortly before it was acquired by Ex-Cell-O in 1930.

5 Cars Account for 78% of Sales

Nine Months' Registrations Gain 25.6%; GM Group Leads with 43.76% of Total

New Passenger Car Registrations

	Sept. 1936	August 1936	Sept. 1935	Nine Months 1936	Nine Months 1935	Per Cent Change, 9 Mos., 1936 over 1935	Numerical Change, 9 Mos., 1936 over 1935	Per Cent of Total Nine Months 1936	Per Cent of Total Nine Months 1935
Chevrolet	55,946	74,496	48,994	758,363	500,665	+ 51.6	257,698	28.28	23.42
Ford	54,726	59,582	43,775	611,783	677,036	— 9.5	—65,253	22.81	31.67
Plymouth	29,326	38,745	17,737	379,845	303,615	+ 25.0	76,230	14.16	14.20
Dodge	15,257	19,816	7,413	191,504	138,175	+ 39.0	53,329	7.14	6.46
Oldsmobile	6,837	13,047	6,089	150,228	114,000	+ 31.6	36,228	5.60	5.33
Pontiac	9,335	12,936	7,427	132,813	109,665	+ 21.2	23,148	4.95	5.13
Buick	5,454	11,378	4,479	114,314	49,972	+129.0	64,342	4.26	2.34
Terraplane	4,257	5,871	2,782	61,472	41,660	+ 47.2	19,812	2.29	1.95
Studebaker	4,808	2,601	2,726	48,330	31,032	+ 55.8	17,298	1.80	1.45
Packard	6,131	5,923	2,827	45,827	24,030	+ 91.0	21,797	1.71	1.12
Chrysler	3,216	4,259	2,284	43,827	34,321	+ 27.8	9,506	1.63	1.61
De Soto	2,712	3,753	1,761	33,506	21,546	+ 56.0	11,960	1.25	1.01
Nash	1,246	1,698	1,374	17,167	13,490	+ 27.2	3,677	.64	.63
Hudson	1,003	1,335	1,061	16,502	16,389	+ 0.7	113	.62	.77
La Fayette	873	1,376	1,920	15,367	13,715	+ 12.0	1,652	.57	.64
Graham	1,096	1,329	1,234	12,842	12,843	.....	—1	.48	.60
Lincoln	1,122	1,056	100	10,026	1,292	+873.0	8,734	.37	.06
Willys	1,003	1,128	594	9,773	7,484	+ 30.6	2,289	.36	.35
La Salle	879	853	740	9,017	8,545	+ 5.3	472	.34	.40
Cadillac	795	913	290	8,800	3,726	+136.0	5,074	.33	.17
Reo	215	244	370	2,739	3,084	— 11.0	—345	.10	.14
Auburn	92	98	349	1,630	4,297	— 62.0	—2,667	.06	.20
Hupmobile	32	49	492	1,515	6,181	— 75.4	—4,666	.06	.29
Cord	89	140	.....	945	.....	.....	945	.04	.....
Pierce-Arrow	67	83	78	625	615	+ 1.7	10	.02	.03
Miscellaneous	379	203	202	3,555	685	+710.0	2,870	.13	.03
Total	208,896	262,912	157,098	2,682,315	2,138,063	+ 25.6	544,252	100.00	100.00
Chrysler Corp.	50,511	66,573	29,195	648,682	497,657	+ 30.2	151,025	24.18	23.28
Ford and Lincoln	55,848	60,638	43,875	621,809	678,328	— 8.2	—56,519	23.18	31.73
General Motors	81,246	113,623	68,019	1,173,535	786,573	+ 49.3	385,962	43.76	36.78
All Others	21,291	22,078	16,009	238,289	175,505	+ 35.8	62,784	8.88	8.21

Automotive Metal Markets

Copper Advance to 10 Cents Followed Heavy Buying; Further Price Increases Likely

By William Crawford Hirsch

Announcement by the leading copper producers on Monday of an advance of one-quarter cent a pound in the price of the red metal, bringing it to 10 cents, the highest level since March, 1931, imparted a strong undertone to the non-ferrous metal market in general. The advance had been expected for some time and was hastened by the spirited bidding of European buyers who drove the export price up to 10⅛ cents. The lowest price that copper sold at during the post-war decade was 11½ cents, the average for these years having been around 15 cents, so that the new price denotes more of a trend toward a long-deferred adjustment than an unforeseen, surprise move. Fabricators of automotive brasses and copper products marked up their prices by one-quarter cent, the advances taking effect Tuesday morning. Whether consumers had any opportunity to place protective orders on Monday is a matter of conjecture. In the copper market, however, heavy bookings were reported. October sales up to the end of last week were estimated at 60,500 tons and in some quarters Monday's before-the-advance business was estimated at 85,000 tons. Market sentiment veered to the belief that, having crossed the 10-cent level, copper was in for further fractional advances and that the market called for more watchfulness than heretofore.

Delays in specifications and shipping orders, due to the usual starting troubles in new model production, caused a slight easing off in pressure on steel finishing mills. This temporary condition is expected to give way to marked quickening of the flow of steel into automotive consumption, following election day. Some of the non-integrated sheet mills are not receiving semi-finished material as promptly as they would like to have it. In strip-steel, demand is principally for wide cold-rolled and narrow hot-rolled strip.

Pig Iron—Increased melts by automotive foundries next month are looked for to bring considerable business to blast furnace sales agencies. Conflicting reports are heard, one to the effect that October buying was largely for piecing out current needs and the other that, in view of the talk of higher prices, there has been much protective buying. Some producers are reported to be planning withdrawal from the market at going prices rather than resorting to an immediate mark-up.

Aluminum—The market for primary metal is unchanged. With more scrap available from Middle West plants, the undertone of the secondary metal market is a shade easier, no price changes, however, being noted so far.

Tin—A fair volume of business in spot Straits tin at the week's opening price of 44 cents is reported to have been done. The rise in copper always exerts more or less of an influence on tin, on the theory that the red metal is one of the key commodities with which we pay for our tin purchases and caused sellers to become more reserved so that bids a quarter cent below their asking price were turned down.

Lead—The market rules strong, with further advances looked for, one producer holding his price $2 a ton higher than another.

Zinc—Firm and quiet.

German Cars to Race in U. S. Next Year, Says Dr. Porsche

Dr. Ferdinand Porsche, consulting engineer of the German group, Auto-Union, and at present visiting in this country, has stated to a representative of AUTOMOTIVE INDUSTRIES that his firm is preparing to enter a team at the Roosevelt Raceway on Long Island next year. Dr. Porsche was very favorably impressed with the raceway and declared that the only reason Auto-Union was not represented is that they had no cars complying with the six litre limit placed on piston displacement.

Amsterdam Importer Arriving

W. L. Cohen, director of N. V. Handelmaatschappij "Conimex," of Amsterdam, Netherlands, will arrive in the U. S. early in December to visit the ASI show in Chicago. Mr. Cohen is interested in the sales rights of automobile accessories and replacement parts for Holland, Belgium, Switzerland and the Scandinavian countries and of hardware and kitchen utensils for Holland.

Portable cranes, hand and electric powered, for shop, factory, warehouse and general utility are illustrated in pamphlet No. 508, recently issued by the Lewis-Shepard Co., Watertown, Mass.*

A booklet, entitled **"Theory and Application of Resistance Welding,"** has been made available by the Electric Controller and Mfg. Co., Cleveland, Ohio.

The Bausch and Lomb Optical Co., Rochester, N. Y., has issued a bulletin describing its **dust counter for measuring dust concentration** in industiral plants.*

The National Electrical Manufacturers Association, New York, has announced publication of the **NEMA Electric Arc-Welding Machine Standards.** This reference contains information on the manufacture, test and performance of d.c. and a.c. arc-welding machines. Copies may be obtained from the Association at 50 cents each.

*Available through AUTOMOTIVE INDUSTRIES.

Calendar of Coming Events

SHOWS

9th International Automobile Salon, Milan, Italy .....November
National Motor Truck Show (N. J. Motor Truck Assn.), Newark, N. J., Nov. 3-7
Canadian National Automobile Show, Toronto .....Nov. 7-14
National Automobile Show, Grand Central Palace, New York.....Nov. 11-18
Omaha Automobile Show.....Nov. 11-15
Philadelphia Automobile Show..Nov. 12-19
Scottish Motor Show, Glasgow..Nov. 13-21
International Aviation Show, Paris, France .....Nov. 13-29
Columbus Automobile Show.....Nov. 14-20
Boston Automobile Show.....Nov. 14-21
Buffalo Automobile Show.....Nov. 14-21
Chicago Automobile Show.....Nov. 14-21
Detroit Automobile Show.....Nov. 14-21
New Haven Automobile Show...Nov. 14-21
Indianapolis Automobile Show...Nov. 14-21
San Francisco Automobile Show..Nov. 14-21
Washington, D. C., Automobile Show, Nov. 14-21
Cincinnati Automobile Show....Nov. 15-21
St. Louis Automobile Show.....Nov. 15-22
Pittsburgh Automobile Show....Nov. 16-21
Brooklyn Automobile Show.....Nov. 21-28
Cleveland Automobile Show.....Nov. 21-28
Montreal Automobile Show.....Nov. 21-28
Kansas City Automobile Show..Nov. 21-29
Milwaukee Automobile Show.....Nov. 21-28
Portland Automobile Show.....Nov. 22-29
Baltimore Automobile Show.Nov 26-Dec. 5
28th Automobile Salon, Brussels, Belgium .....Nov. 28-Dec. 9
Peoria Automobile Show..Nov. 30-Dec. 5
Natl. Exposition of Power & Mechanical Engineering, Biennial Meeting, New York City .....Nov. 30-Dec. 5
First International Consumers Petroleum Exposition, Convention Hall, Detroit .....Dec. 5-13
Automotive Service Industries Joint Show, Chicago .....Dec. 9-13
National Motor Boat Show, New York, Jan. 8-16
Illinois Automotive Ass'n, 4th Annual Show and Maintenance Exhibit, Navy Pier, Chicago.....Apr. 24-28, 1937

CONVENTIONS AND MEETINGS

American Petroleum Institute, Annual Meeting, Chicago .....Nov. 9-12
Society of Automotive Engineers Annual Dinner, New York .....Nov. 12
American Association of Motor Vehicle Administrators, Annual Meeting, Hot Springs, Ark. .....Nov. 12-14
International Day, National Automobile Show, New York.....Nov. 16
National Foreign Trade Convention, Chicago .....Nov. 18-20
16th Annual Meeting, Highway Research Board of the National Research Council, Washington, D. C...Nov. 18-20
International Acetylene Assn., 37th Annual Convention, St. Louis, Nov. 18-20
Natl. Industrial Traffic League, Annual Meeting, New York City....Nov. 19-20
Trailer Coach Manufacturers Association, Annual Convention, Chicago, Nov. 19-20
Tin Can Tourists' Get-Together Meeting, Lake City, Fla. .....Nov. 22-28
American Society of Mechanical Engineers, Annual Meeting, New York, Nov. 30-Dec. 1
National Standard Parts Association, Annual Convention, Detroit...Dec. 7-8
Tin Can Tourists' Homecoming, Arcadia, Fla. ....Dec. 28, 1936-Jan. 3, 1937
S.A.E. Annual Meeting, Detroit, Mich., Jan. 11-15, 1937
Tin Can Tourists' Winter Convention, Clearwater, Fla.....Jan. 29-Feb. 8, 1937
Tin Can Tourists' Winter Convention, Sarasota, Fla. .....Feb. 8-14, 1937
International Association for Testing Materials, Second International Congress, London, England, April 19-24, 1937
41st Annual Convention and Exposition of the American Foundrymen's Association, Milwaukee, beginning May 2, 1937

Just Among Ourselves

Walsh-Healey Points Clearer

SEVERAL weeks ago, in our issue of Oct. 3 to be exact, some mention was made of the position of the automotive industry under the Walsh-Healey Act. Since the words were written, specific interpretations of the act by the Secretary of Labor's office have nullified some of the points we made and we are, therefore, calling attention to the present situation.

On Oct. 3 it seemed that sub-contractors might be forced to comply with the act by an insistence on the part of the Labor office that successful bidders would have to certify compliance of sub-contractors as part of the conditions surrounding the bid.

This does not now seem to be true. It is said, for example, that a comparison between the original draft of the bill and the act in definite form indicates that the sub-contractor provision was expressly eliminated. It seemed to us, however, that the bill in its final form left the way open for forcing compliance. We are glad to record that this does not appear to be the case.

Split Bids Prohibited

WITHIN the current week the procurement division of the Treasury Department moved to prevent "splitting" of bids on Government contracts by contractors wishing to avoid the $10,000 minimum provisions of the Walsh-Healey Act. Several truck manufacturers bidding on Government requirements, on contracts whose presumed value would exceed $10,000 expressly stipulated in the bids that they were to cover only a number of units whose value would not exceed $10,000. Only one manufacturer bid across the board. All the bids were rejected. Re-advertisement of them by the Treasury carried a statement that subsequent bids were to be on an "all or none" basis.

It has been pointed out that the adoption of such a policy will cost the Government (on trucks, for example,) more per unit that if the split bids were entertained.

So, on this point at least, a showdown seems imminent, and as in the case of the NRA, the automotive industry is well in the van of those who are willing to protest an onerous statute, even when it involves the sacrifice of business.

Public Indifferent to Regular Lubrication

IN an address before the recent convention of the National Association of Lubricating Grease Manufacturers, Thomas J. O'Kane, representing a Chicago advertising agency, pointed out that although passenger-car manufacturers usually recommend chassis lubrication every 1000 miles of car operation, ultra-conservative estimate would place the average mileage between lubrications at 2000.

In such public indifference to the necessity for frequent, regular lubrication of a car he finds a challenge to grease manufacturers, which if met through institutional advertising might double their automotive market.

And so it might, particularly if it began with a campaign to educate the service man and the car dealer to neglected opportunity in the form of unsold greasing jobs.

Some More GM "Research"

WE have mentioned from time to time the many things done by General Motors to sound the consumer pulse, including establishment of the now celebrated Customer Research Department.

One activity which came along a while back, but which has not yet been mentioned, is a mailing piece sent out by the Public Relations Department of G. M., whose attached letter begins: "Dear Friend: Your name has reached this department as a recent purchaser of a General Motors Product."

An attached (and refreshing) questionnaire seeks light on the customer's reaction to G. M. magazine advertisements on "value," G. M.'s own automobile shows held in the spring, G. M. radio concerts, the "Parade of Progress," and several other G. M. merchandising ideas.

The last two pages of the questionnaire are a beautiful sample of practical psychology. The customer is asked:

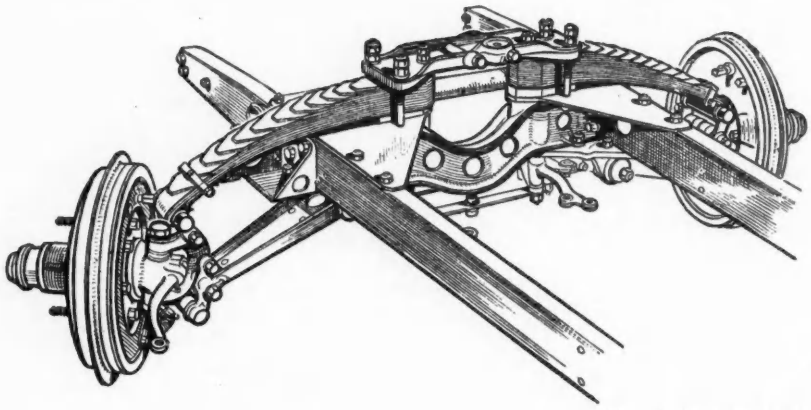
"Suppose that you with your viewpoint and experience as a practical car buyer, were sitting in a General Motors Executive Conference and were called upon for advice on all these activities, just how would you 'vote'?

Space is provided for checking a "vote" on the question of whether each of the activities should be "expanded," "reduced," "eliminated," or "continued as is."

We're willing to wager that the proportion of "votes" to mailing was higher than the proportion of votes to eligible voters in the national elections.—H. H.

London Show —

Gives Broad Picture of



(From the Autocar, London)

Independent front suspension of new Alvis Seventeen

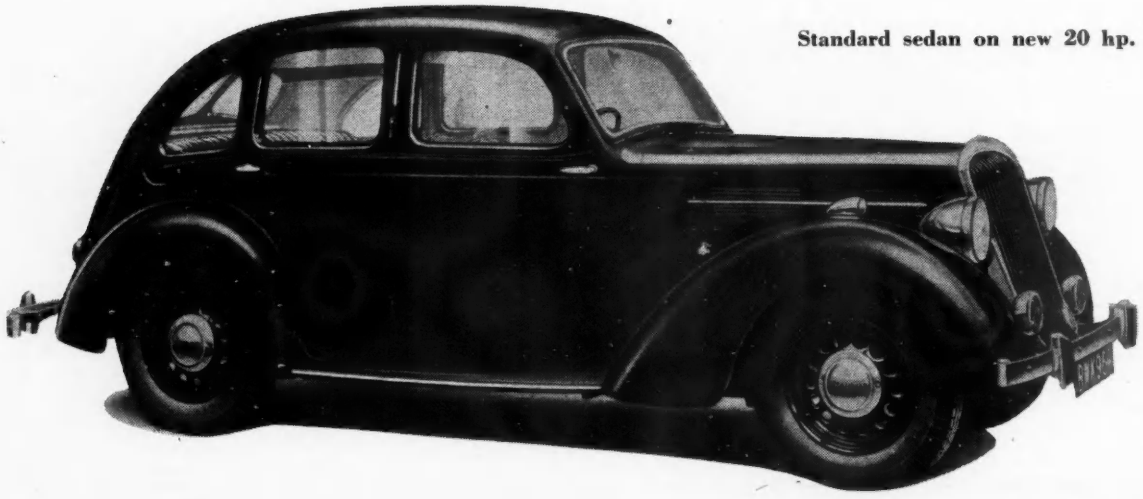
THE annual London passenger car show is being held in the Olympia group of halls for the last time; next year and thereafter it will be held in an immense new exhibition building now in course of erection on a 12-acre site at Earls Court, which also is on the western side of London and only about half a mile from Olympia.

The total number of exhibitors at Olympia this year is 530. Exhibits are grouped in seven sections, viz., cars shown by manufacturers or their British concessionaires, cars shown by custom body-builders, accessories and components, caravans and trailers, motor boats, and miscellaneous. In the car section there are 54 exhibitors, 30 British and 24 foreign. American cars represented are Auburn, Buick, Cadillac, Chevrolet, Chrysler, Cord, Dodge, Graham, Hudson, Nash, Oldsmobile, Packard, Pontiac, Studebaker and Terraplane.

Although representative of the products of England, United States, Canada, France, Italy, Germany and Belgium, the present show fails to indicate any important new trend that has a clear prospect of becoming the more or less general practice in the near future. Not even independent front springing has gained appreciably since last year's show, so far as British cars are concerned, for only one additional British manufacturer has adopted it.

Humber and Hillman, both on six-cylinder models only; Rolls-Royce on the V-12 only; Sunbeam, Vauxhall (on all models for the first time), Alvis and Lagonda on a new V-12 are the only prominent makes with independent front suspension, and all of them except Lagonda had it last year or earlier.

Several makers have, however, modified and improved their half-elliptic suspensions by using a torsion-bar stabilizer (anti-sway bar) either at the front or rear, or both. Rolls-Royce now has one on the V-12 for the rear spring-



Standard sedan on new 20 hp. V-8 chassis

By M. W. Bourdon

f Automobile Industry in Great Britain

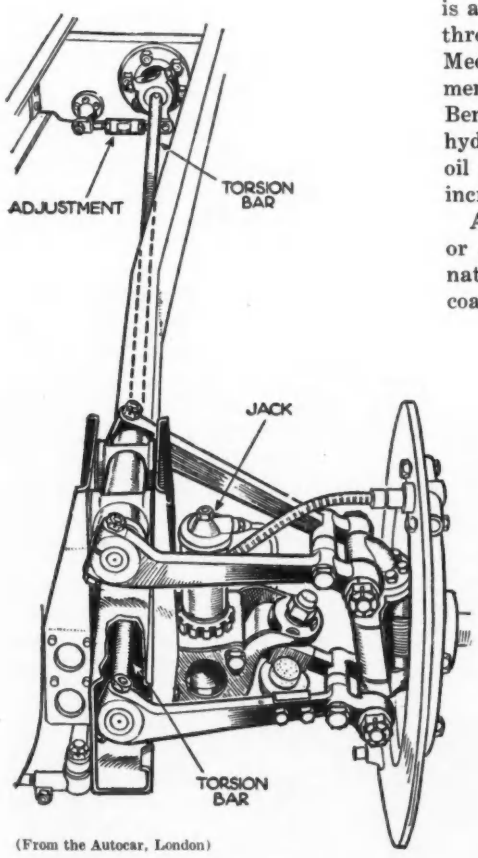
ing; Standard has one at the front on continued models of 12 hp. and over, and two on a new V-8; Vauxhall has one at the rear of the new 25 hp. Six, but not on the smaller Sixes with independent front springing.

The only other new feature of British suspension systems in general is that about half-a-dozen makers are providing the Luvax system of shock absorber control that was first seen at Olympia last year in the accessory section. This consists of a small vane pump on the shaft of an hydraulic shock absorber that increases the oil pressure with increase of spring deflection, thus providing additional damping effect; there is an "over-riding" manual control with three positions, viz., Hard, Soft and Medium. This scheme differs fundamentally from the Rolls-Royce and Bentley "ride control," in which the hydraulic pressure is gained from an oil pump driven from the gearset, so increasing with the speed of the car.

A few makers are again fitting zinc or other metallic interleaving in laminated springs, while S. S. has lead-coated spring leaves. There are very few British cars with leather covers (or "gaiters" as they are called in England), and none now with the metal type; and only Rolls-Royce carries "one-shot" lubrication to the spring leaves. There are a few makes with automatic chassis lubrication; it is, however, generally considered unnecessary, owing to the majority of cars having so many chassis bearings of the "Silentbloc" oil-less type.

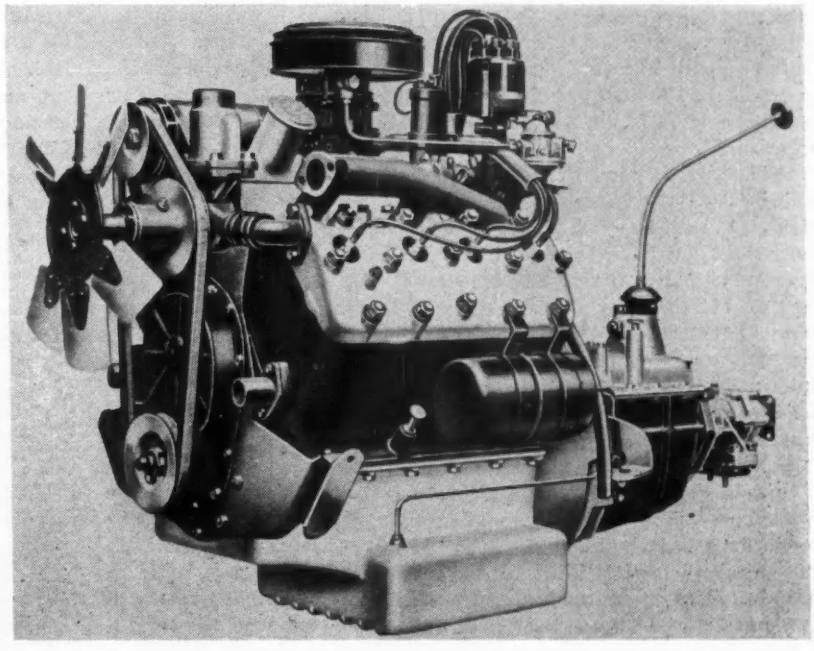
There is no British car with front-wheel drive except the B.S.A. "Scout," a small sports model of 10 hp. that has been on the market for several years, originally as a three-wheeler. Nor is there now a British rear-engined car, for neither the Trojan with its 10 hp. horizontal two-cycle engine nor the Burney Streamline is now in production.

The horsepower tax concession af-

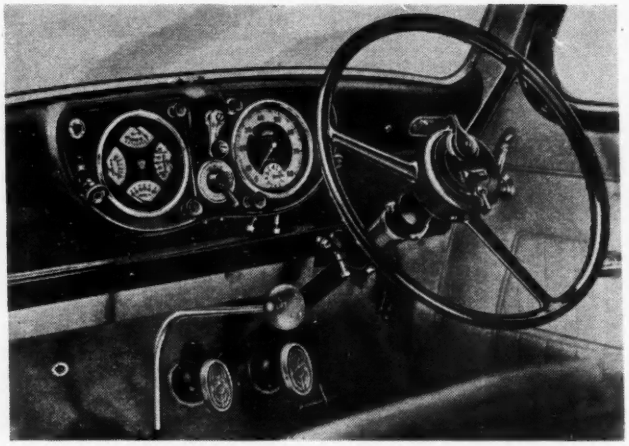


(From the Autocar, London)

Front independent suspension of new Lagonda V-12



Standard V-8 engine with cast (Meehanite) crankshaft

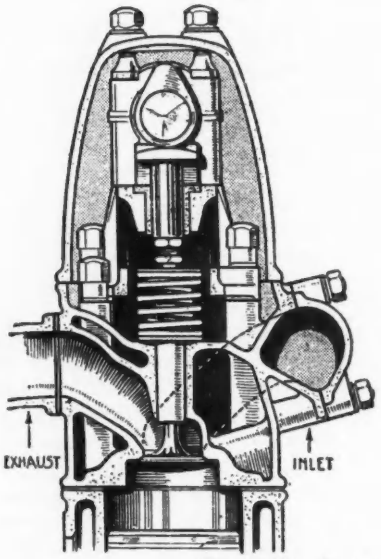


Instrument board and controls of the Standard V-8. Features of the controls are an extensible steering column and a pull-back brake handle

forded by the Government last year (a reduction from 20s to 15s per hp.) has not materially increased the demand for cars of more than 12 hp. rating. There is, nevertheless, a trend toward increased piston displacement in the smaller sizes. While the 7-12 hp. range still includes approximately 80 per cent of British sales, or with 14 hp. models about 90 per cent, a few thousand more cars of larger sizes have been sold in England this year, but the increase has been no greater in proportion than that of sales of the smaller cars.

A feature of the new models appearing at Olympia is the increased number of 14 hp. tax rating. These include the Morris side-valve Six and the associated Wolseley overhead-valve Six, both introduced in June, and an enlarged Armstrong-Siddeley Six previously known as the Twelve Plus. Austin has a redesigned model designated a 14 hp., though it has an engine of the same size as the 1936 Twelve-Six—both actually of 15.9 hp. tax rating! Lanchester has a new Fourteen Six displacing the 1936 Twelve, but a new Standard side-valve engined Fourteen (108 cu.in.) and a new Triumph of the same rating with overhead valves have four-cylinder engines.

There are only two British cars at the show with V-8 engines; one is the 18 hp. Riley (132 cu. in.) introduced last year but which has barely gone into production; the other is the new 20 hp. Standard of 164 cu. in. Of two further V-8 cars introduced just prior to the show but not exhibited at Olympia, one is known as the Autovia and is produced by a company associated with Riley; it has an overhead-valve engine rated at 23.8 hp. (172 cu. in.) and is an expensive job, the sedan being £975. The other new V-8 is the 213-cu. in. Jenson, made by a body-building firm that has not produced chassis hitherto and uses a 30 hp. Ford engine with modifications and an American two-speed rear axle,



(From the Motor, London)

Section through cylinder head and valve housing of new Lagonda V-12 engine

three-speed gearset and transverse springs front and rear. With a sports sedan body the price is £695.

The Riley V-8 sedan is £450 and the Standard £349. The last-mentioned is already in production and is capable of 80-85 m.p.h. and acceleration from 10 to 30 m.p.h. in 7.5 sec., or from a standstill to 50 m.p.h through the gears in 12 sec.

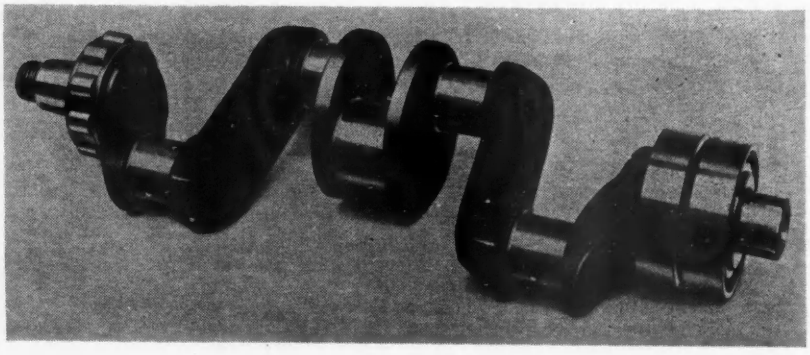
This new V-8 Standard comes into a different price-class from that of the 22 hp. V-8 Ford recently introduced in England, and Standard would be quite justified in adopting the slogan that Ford uses in England, viz., "There is no comparison." But it is of interest to note the following comparisons in regard to certain leading particulars of these two cars:

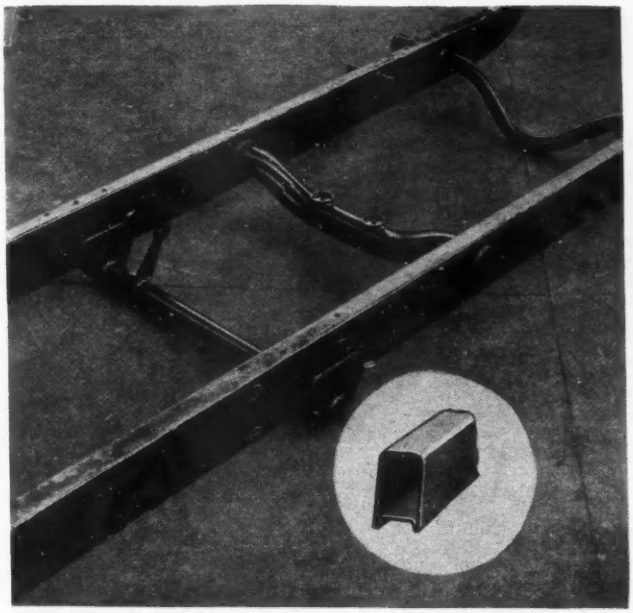
	Ford	Standard
Piston displacement ..	136 cu. in.	164 cu. in.
Wheelbase	108¼ in.	102 in.
Track	55¼ in.	52 in.
Rear seat width	51½ in.	45 in.
Width overall	69½ in.	63 in.
Height overall	66½ in.	63½ in.
Length overall	173 in.	165 in.
Weight	2540 lb.	2650 lb.
Price, four-door sedan.	£210	£349

Despite the greater overall length of the Ford it provides no more legroom at the rear than the Standard, if as much, though owing to differences in upholstery style and angle it is impossible to give comparative dimensions in this respect, just as it is impossible to convey adequately in words the differences between the two cars that may be held to justify the higher price of the Standard. The latter has a peculiarly massive chassis of cruciform or hour-glass design, the box section side rails being inswept to the center. The body has channel-section foundation members that bridge the space at each side where the chassis is inswept and serve to increase the resistance of the latter to deflection. Springing is by half-elliptics controlled by torsion-bar stabilizers fore-and-aft, the bars being coupled to the shafts of the hydraulic shock absorbers.

Among points of interest in the three-point rubber mounted Standard V-8 engine is the cast-iron crankshaft of an alloy known as Meehanite; it is fully counterweighted and has journals of 2½-in. diameter and 2-in. pins. Connecting rods are side by side on the pins; like the journal bearings, the big-ends have steel-backed white-metal liners. Valves are inside the Vee, with non-adjustable cast-iron cam followers,

New three-bearing crankshaft of Austin Seven





Box-section frame of new Alvis Seventeen. The inverted channel, with channel-section strip welded in, is shown in the inset

original clearances being effected by steel thimbles on the valve stems. The steel camshaft has high-clearance cams, the standard clearance being 0.015 in. Cylinder heads are aluminum, with machined combustion chambers, and bridging the Vee is a cast aluminum unit in which are formed the duplex induction manifolds with exhaust heating. A twin-choke Solex carburetor of a new easy-starting type is used.

Like other Standard cars, this new model has a four-speed gearset with synchromesh on second, third and fourth. The body is an all-steel construction, including the floor, and has an all-steel sliding roof. Fitted suitcases are provided as normal equipment in the tail locker, which also contains the spare wheel carried horizontally. The furnishings are on deluxe lines, with Dunlopillo (sponge rubber) overlays for the upholstery springing in place of hair—a feature found on other British cars for 1937.

Standard is among the first half-dozen British manufacturers in output. The two largest, Morris and Austin, have not produced any new model with outstanding features; Morris, in fact, has come to Olympia with models unaltered in any obvious respect from those that have been in production since a new 14 hp. Six was added in June, a car on conventional lines. Earlier in the year a new chassis with optional 10 hp. and 12 hp. four-cylinder engines was put forward, displacing models of similar size and supplementing the 8 hp. Four and the 16 hp., 18 hp., 21 hp. and 25 hp. Sixes that were at Olympia last year. At £265, the 21 hp. and 25 hp. sedans are still the lowest-priced British cars of these or similar ratings.

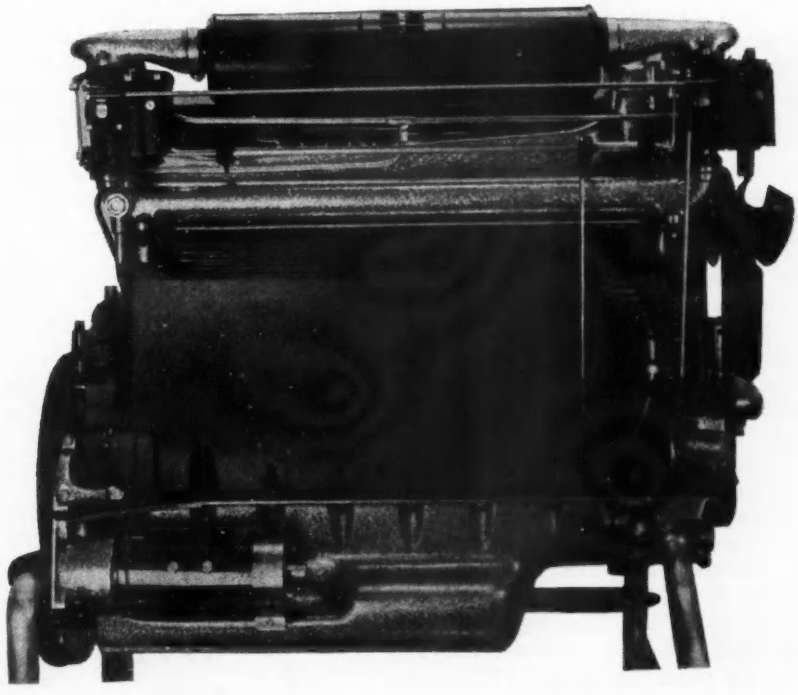
Austin has new modernized bodies for continued models and a new chassis, the Fourteen, that is based on a continued model (the Sixteen Six), but has a new frame, new brakes (Girling mechanical type) and a new engine mounting. The Seven engine now has been given a three-bearing crankshaft (instead of two); the front bearing is two-row ball type, the rear has parallel rollers, while the center one is a plain bearing.

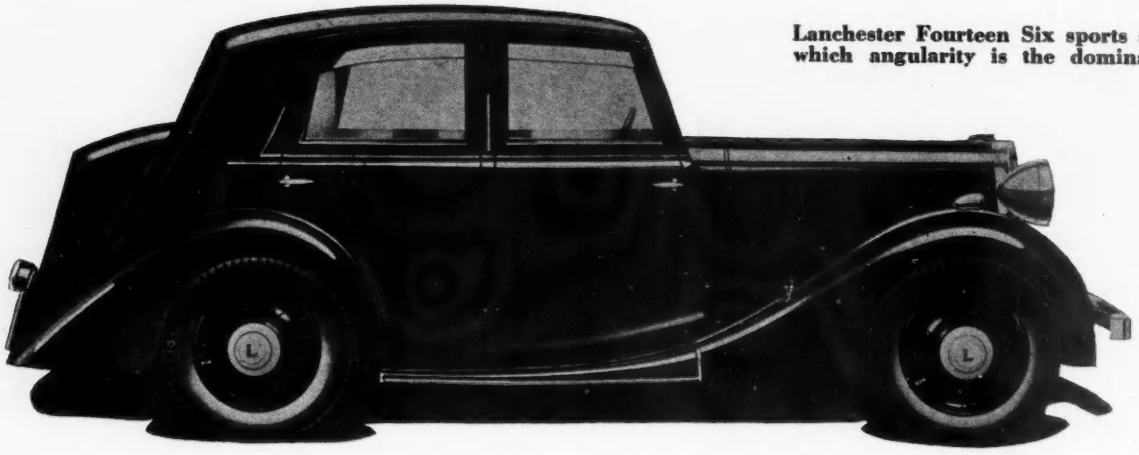
Vauxhall, now also ranking among the first six in England as regards output, is showing the new 25 hp. Six, of which particulars have already appeared in AUTOMOTIVE INDUSTRIES (Sept. 26). This model, it may be recalled, has independent front suspension by means of torsion bars and tubes, and a coil spring on each side that—through a spear-head cam—helps the bars and tubes to twist under small vertical movements of the adjacent wheel, but becomes ineffective when the wheel movement exceeds a certain amount Thus a dual-rate suspension is provided —"soft" springing for moderately smooth roads and harder springing for bad roads. The rear half-elliptics have torsion-bar control.

Among other features not hitherto associated with Vauxhall practice, the new "25" has Lockheed brakes with a tandem master cylinder, an extensible steering column, starting by means of the clutch pedal, and a semi-centrifugal clutch. Like the smaller Sixes, 12 hp. and 14 hp. (which are continued with detail variations at reduced prices), the "25" has a four-speed transmission with synchromesh on third and fourth. The Standard sedan is £298, which compares with £325 for the superseded model that had optional engines of 20 hp. and 27 hp.

With very few exceptions, all British manufacturers are using members of box section for chassis frames, for the whole or parts of the side rails, and in some cases for cross-bracing members also. Similarly, the majority have frames with cross-bracing at the center. Alvis is one of the exceptions in the

Sunbeam straight-eight engine. An interesting feature is the straight horizontal inlet manifold with a carburetor at each end





Lanchester Fourteen Six sports sedan in which angularity is the dominant note

latter respect, and is unique in the type of box section members used for the side rails of a new 17 hp. Six, a model designed under the technical direction of George Lanchester who, with his brother F. W. Lanchester, produced the first Lanchester car in 1895, and who continued to be associated with this make until a short time ago.

The frame of the new Alvis consists of two side rails, straight in plan and —apart from a kick up over the rear axle—in elevation also; there are six tubular cross members, supplemented at the front by a bridge stamping that carries the quarter-elliptic springs of the independent front suspension. Each side rail consists of a member of deep inverted channel section with a shallow inverted channel welded inside at the bottom. Incidentally the shallow channel is used to accommodate out of sight many of the pipe-lines and cables where they run fore-and-aft. Inside the box section, in line with the rear spring brackets, tubular cross members and at certain other points, are welded-in webs or similar stiffening units; all joints, including those of tubular members with the side rails, are welded. For this frame it is claimed that the torsional rigidity is at least the equal of the conventional cross-braced frame, with lower cost and lighter weight, due to its simplicity of construction. Another point is that welding the shallow channels to the bottom of the deep channel to form the box section gives rise to less distortion of the members than is usual in welding plates to the side of the conventional channel.

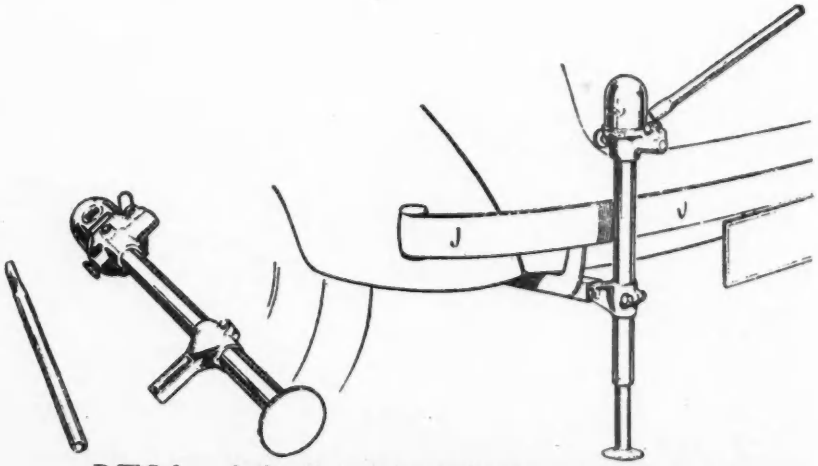
Alvis now has all models with independent front springing and independent steering connections. The new "17" front suspension differs from that of the other models in that, instead of a single inverted half-elliptic being used, there are two quarter-elliptics, one at each side, secured to the stamping previously mentioned. This variation is to enable the engine to be brought farther forward, the "nose" of the timing casing being accommodated with clearance above the center of the stamping.

The demand for higher performance has caused Alvis to produce a new model of 262 cu. in. displacement in place of the 213-cu. in. type introduced last year, and though it consists practically of the same chassis with a larger engine, the price is lower by £25; even so, it is an expensive car, for the standard four-door sedan is £995. The 213-cu. in. engine is now used in a "Speed Twenty-five" which, like the new 262-cu. in. model comes very near to classification as a 100 m.p.h. car. Both engines have overhead valves, three S.U. carburetors and a seven-bearing crankshaft.

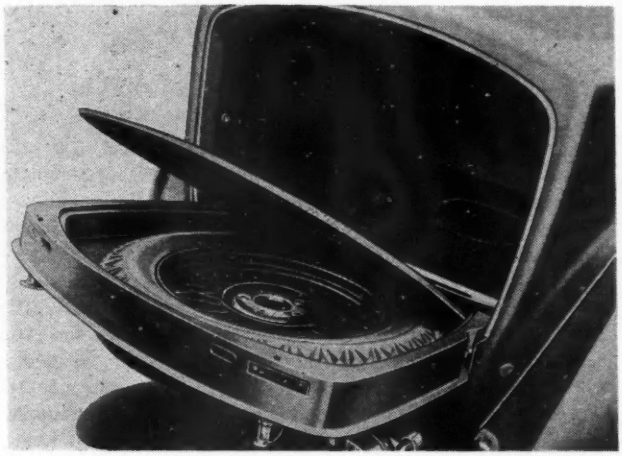
The makers of the S.U. carburetor have introduced a new easy-starting device that is being used by several car manufacturers. It consists of an auxiliary carburetor that provides a rich mixture to supplement that from the main carburetor when the temperature of the cooling water is below about 140 deg. F. This device is brought into or taken out of operation by a mushroom valve located between the small carburetor and the induction tract; the valve itself is operated by a solenoid, the circuit of the latter being opened or closed by a small thermostat affected by the water temperature. The driver has no control, so that as far as he is concerned, starting from cold does not differ in any way from starting with the engine hot.

The name of Sunbeam has appeared again at Olympia, after being absent last year for reorganization, and is represented by a new straight-eight in the luxury-car class, with chassis prices from £750 and cars from £1240. It has been designed by Georges Roesch, chief engineer of the English Talbot Company, which is a unit of the Humber-Hillman combine, the leading spirits of which are the Rootes brothers, who acquired the Sunbeam concern last year. In effect, therefore, the combine now includes Sunbeam as well as the other three cars, in addition to Commer and Karrier trucks.

Developing approximately 150 b.hp.



D.W.S. loose hydraulic jack for application to a frame socket at each corner of the chassis



Spare wheel carried in rear-locker door of Rover

at 4500 r.p.m., the new Sunbeam engine has a piston displacement of 275 cu. in., pushrod-operated overhead valves, a case-hardened counterweighted crankshaft with ten bearings, and bimetallic pistons. The induction manifold is perfectly plain and straight, with four very short branches to the siamesed inlet ports, and has a downdraft carburetor at each end. Incidentally, this manifolding and carburetion system enables a very neat arrangement of the two air silencers to be made; of cylindrical shape, they lie end-to-end above the valve cover. Oil temperature is regulated by delivery from the pump passing up through pipes that lead through the water jackets before descending to the bearings.

Independent front suspension is used and, following the lines of that of earlier Sunbeam models, consists of a half-elliptic spring with "wishbone" swinging arms and radius rods running back alongside the frame. The steering tie-rod is articulated at the center. Lubrication of the front suspension joints is effected in a novel way; each time the engine oil-filler cap is removed to replenish the sump, a plunger pump is operated and forces oil to the joints mentioned. The dip-rod serves also to open the drain of the sump if forced down against a spring. Hydraulic shock absorbers are used, with manual control of the leak valve.

This new Sunbeam is another car model which, like the Alvis, has a frame of box section members without cross-bracing; but in this case the cross members as well as the side rails are of box section, not tubular as on the Alvis.

W. O. Bentley, who left Rolls Royce some time back and became technical director of the Lagonda Company, has produced a new V-12 Lagonda of 275-cu. in. capacity but of different appeal from that of the six-cylinder 275-cu. in. model, which is essentially a speed model. The new type is intended for luxury bodywork and is offered in two lengths of wheelbase—136 in. and 142 in.—the track in each case being 60 in. Prices of complete cars range from £1,500.

This new Lagonda has independent front springing. The stub axles are located by wishbone links, the lower one of each pair being attached to a long torsion bar that runs back inside the box section side rail and is secured at the rear to an adjustable anchorage. All

(From the Autocar, London)

Cushion filling formed of sectional units of Dunlopillo (sponge rubber)

bearings of this front suspension are of ball or roller type, with oil leads from the automatic chassis lubricating system. Articulated track rods are used. Rear suspension is conventional, with a torsion-bar stabilizer. Transmission is by a four-speed synchromesh gearset and hypoid bevels. Brakes are of the Girling type.

Features of the V-12 Lagonda engine include a single overhead camshaft for each block, with valves in line and operated through short vertical cam-followers. The bore-stroke ratio is unusual in British practice, the stroke being only 84.5 mm. with a 75 mm. bore. Light alloy connecting rods are used, with unlined big ends contacting directly with the pins of the nitralloy steel crankshaft. The latter is counterweighted and has a torsional vibration damper. There are two oil pumps, one for the crankpins and journals, the other for the overhead valve gear and distribution; the latter consists of helical gears and a pair of duplex roller chains for the camshaft drives. Another chain drives the water pump and generator. Both cylinder blocks are unit cast with the crankcase of nickel-iron and have detachable heads of the same material. The engine develops 140 b.hp. at 3400, but is designed for speeds of over 5000 r.p.m., the latter rate implying 100 m.p.h. with the standard rear-axle ratio (4.27 to 1).

As may be gathered from the foregoing, additional British manufacturers are catering for the class of buyer who seeks high performance and luxury bodywork. Rolls-Royce, Bentley, Lagonda, Alvis, Sunbeam, Daimler, Armstrong Siddeley and Talbot all have models capable of from 80 to 100 m.p.h. at prices ranging from about £1,000 to £2,500 for complete cars, and the new eight-cylinder Autovia also falls within this class.

Reverting to general trends of design, the aluminum head for side-valve engines is being more extensively used by British manufacturers, sometimes die-cast, usually with a compression of 6.5 to 1. The extensible steering (a Bluemel specialty) is fitted by several more makers; the downdraft carburetor is almost but not quite universal; worm-and-nut steering gear has displaced the cam and lever type in a number of cases; brakes are generally Lockheed, Bendix cable, Girling or Bendix Cowdrey, flexible engine mountings are all but universal with a trend toward the use of a flexible "steady" to stop "flutter" on the mountings at low speeds; only the new Vauxhall "25" has a semi-centrifugal clutch, though Riley on all models and Armstrong Siddeley and Talbot on some fit a fully automatic clutch between the engine and a Wilson type preselective gearset; pressed steel spoked disc wheels (known as "easy-clean" wheels) have largely displaced the wire wheel on cars of popular types. Very few British cars have vacuum ignition timing control, but practically all makes and models now have some form of easy jacking system.

The last-mentioned feature has developed considerably during the past twelve months. Until the middle of 1935 there was only one system of integral jacking that gained any favor worthy of note, viz., the D.W.S., mechanical type, with one screw jack at the

(Turn to page 590, please)

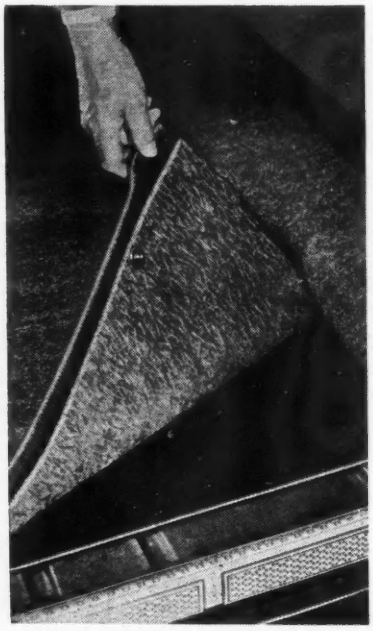
Comfort and Style

IMPROVEMENTS made in the DeSoto for 1937 parallel closely those made in other Chrysler lines and include appearance, safety and comfort features. The new line, built on a chassis of 116-in. wheelbase and 199-in. overall length, is available in nine body types, including a four-door touring sedan with trunk, a four-door sedan with luggage compartment, a two-door touring brougham with trunk, a two-door brougham with luggage compartment, a business coupe with rumble seat, a business coupe with rear luggage deck, a convertible coupe with rumble seat, a convertible sedan, and a seven-passenger sedan.

A number of changes have been made in the front-end styling. The hood of the car, which is stamped out of one piece, is hinged at the rear and opens by lifting in front. The radiator ornament now acts as a hood-lock control. Front fenders eliminate the "cat-walk" between the fenders and the hood. The headlamps, with lenses of increased diameter, are supported from the side of the radiator.

At the rear end the body has more slope, and trunks and rear-deck panels blend into the body lines. Trunks and luggage compartments are both larger than they were last year. Tail lamps are mounted on the fenders and license-plate brackets in the center of the trunks and luggage compartments.

The seamless steel top extends from the cowl back to the trunk opening and is welded to the body structure. A deep drip molding, over the doors and rear-quarter window, is welded to the roof before the latter is joined to the rest of the structure. The body structure has been strengthened by the use of more substantial braces in the cowl and the rear end. Door hinges are now bolted to the door posts. The box-section center post has a wider flare at the top and a rabbeted surface which adds to its strength and cuts down drafts between doors and posts. The steel floor has been redesigned and its rear portion (in the rear compartment) is now lower and level. Reinforcement members have been added under the floor.



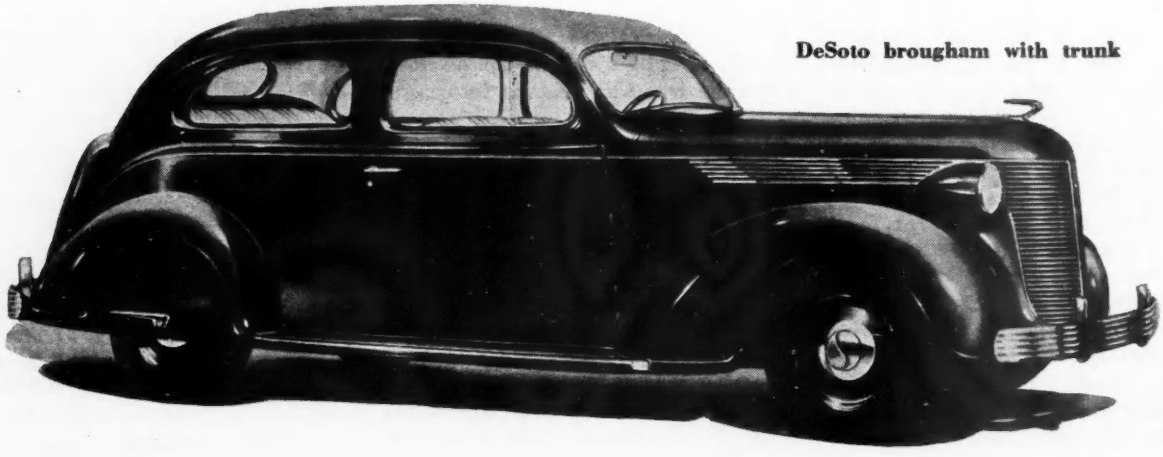
How the metal floors of DeSoto bodies are "sound-proofed."

Insulation of the body has been improved. A heavy insulant, impregnated with asphalt, is used under the steel roof and on the upper rear quarter and cowl. Another grade of insulating material is bonded to the steel floor when it passes through the paint-drying ovens.

New-type body mountings, direct-double-acting hydraulic shock absorbers, an improved steering hook-up, a new ride stabilizer and a forward shift of the seats combine to improve the riding qualities. Body-mounting brackets are riveted to the frame, and the body is bolted to these brackets, but rubber insulators prevent metal-to-metal contact. The body bolt is also rubber-insulated. A steel spacer is incorporated in the mounting so that the bolts can be tightened only to a predetermined degree. This type of body mounting is intended to prevent road noises from being transmitted from the frame to the body.

The direct-type of shock absorbers are insulated from both the springs and the frame by rubber bushings. A large volume of oil and large valves keep down the working pressure. By mounting the shock absorbers at an angle, they help to control side sway. A new ride stabilizer is mounted at the front end, by rubber bushings and washers and steel brackets, to the under side of the frame and connects by links to the front spring seats on the lower control arms of the independent suspension units. It is independent of the shock absorbers. A pantograph type of independent front suspension is used.

There are individual tie rods between the steering arm (or pitman) and the

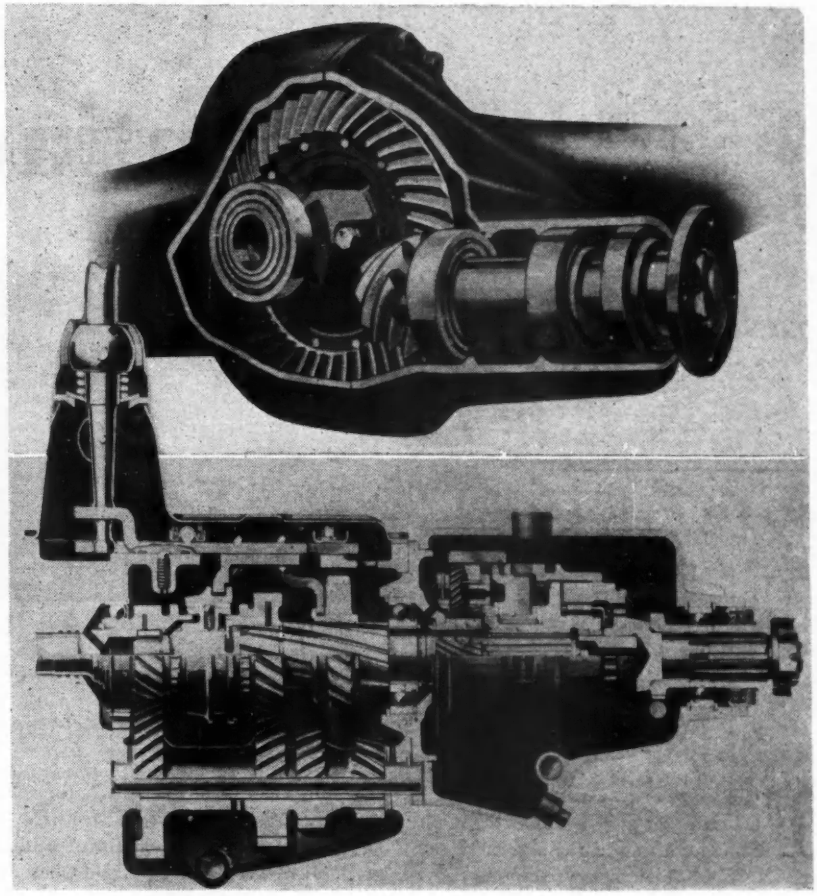


DeSoto brougham with trunk

knuckle arms. Tie-rod connectors are sealed with leather to keep out dirt and moisture. The knuckle-pin angle has been reduced from 9 to 4½ deg. to render steering easier. Front-wheel spindles have been increased in diameter, and larger inner wheel bearings are used. A worm-and-roller-tooth steering gear, with a ratio of 18.2, is used. The steering-wheel diameter has been increased from 17 to 18 in. The rear-wheel tread has been increased to 60 in. To obtain a better weight distribution, both the engine and the seats were moved forward.

All of the safety features which were described in connection with the Dodge line are incorporated also in the new DeSotos.

Front seats, which now measure 47 in. across, are wider and now accommodate three adults comfortably. These seats may be moved 2 in. forward and back from their normal central position. The width of the back seat has been increased to 48½ in., and additional leg room is provided by a foot rest recessed into the back of the front seat. These increases in seat width and leg room were made possible by increasing the length of the bodies 4 in. and the width at the cowl 3¼ in. Lower floors give more head room. The ventilating windshield measures 43 in. across and is controlled by a folding-type regulator. "Butterfly" ventilating wings,



(Top)—Mounting of the stem pinion of the hypoid rear-axle gears.

(Bottom)—Sectional view of the Syncro-Silent transmission with the (extra) overdrive

e Mark the New DeSoto Line

mounted on friction pivots, are built into the forward section of front-door windows. They swing in a wide arc and scoop air into the front compartment when it is desired. The rear section of the front-door windows lowers completely out of sight. Rear-section "butterfly" windows also swing wide to provide the proper ventilation.

Engines have the same bore (3⅜ in.) but ¼ in. less stroke (4¼ in.) than last year, and the piston displacement is now 228 cu. in. The standard compression ratio has been increased to 6.5 and the engine rates 93 hp. at 3600 r.p.m. An aluminum cylinder head with a compression ratio of 7 is available. New engine features include larger valves, improved porting, symmetrical connecting rods, U-slot aluminum-alloy "anodized" pistons with four rings, austenitic-steel exhaust valves, an improved oil filter, an air filter with removable filter element, and self-locking tappet-adjustment screws.

The fan-cooled generator is of larger capacity. There is a ball release bearing with a new Oilite ball retainer on the 10-in. clutch. The bearing is "prelubricated" and requires no lubricating attention in service.

An overdrive is available and when supplied is in a separate case at the rear of the transmission. There is then a ball bearing between the two units, which provides better support for the main shaft. The overdrive engages automatically at between 35 and 40 m.p.h. The "Syncro-silent" transmission, with all helical gears, has been improved to make shifting easier and operation quieter. It now has a roller on the second-speed shifting rail, and there are six anti-friction bearings in the transmission.

The new hypoid rear axle lowers the propeller shaft and allows a low and

(Turn to page 583, please)

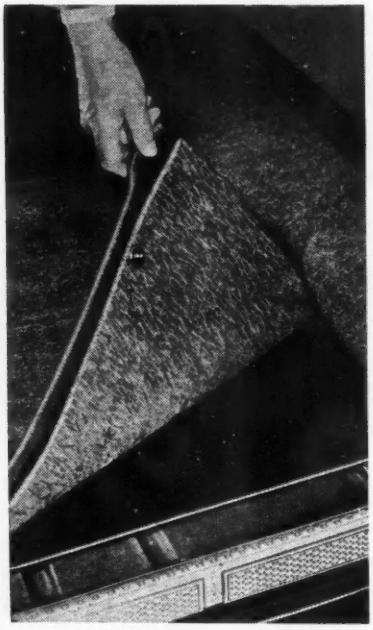
Comfort and Style

IMPROVEMENTS made in the DeSoto for 1937 parallel closely those made in other Chrysler lines and include appearance, safety and comfort features. The new line, built on a chassis of 116-in. wheelbase and 199-in. overall length, is available in nine body types, including a four-door touring sedan with trunk, a four-door sedan with luggage compartment, a two-door touring brougham with trunk, a two-door brougham with luggage compartment, a business coupe with rumble seat, a business coupe with rear luggage deck, a convertible coupe with rumble seat, a convertible sedan, and a seven-passenger sedan.

A number of changes have been made in the front-end styling. The hood of the car, which is stamped out of one piece, is hinged at the rear and opens by lifting in front. The radiator ornament now acts as a hood-lock control. Front fenders eliminate the "cat-walk" between the fenders and the hood. The headlamps, with lenses of increased diameter, are supported from the side of the radiator.

At the rear end the body has more slope, and trunks and rear-deck panels blend into the body lines. Trunks and luggage compartments are both larger than they were last year. Tail lamps are mounted on the fenders and license-plate brackets in the center of the trunks and luggage compartments.

The seamless steel top extends from the cowl back to the trunk opening and is welded to the body structure. A deep drip molding, over the doors and rear-quarter window, is welded to the roof before the latter is joined to the rest of the structure. The body structure has been strengthened by the use of more substantial braces in the cowl and the rear end. Door hinges are now bolted to the door posts. The box-section center post has a wider flare at the top and a rabbeted surface which adds to its strength and cuts down drafts between doors and posts. The steel floor has been redesigned and its rear portion (in the rear compartment) is now lower and level. Reinforcement members have been added under the floor.



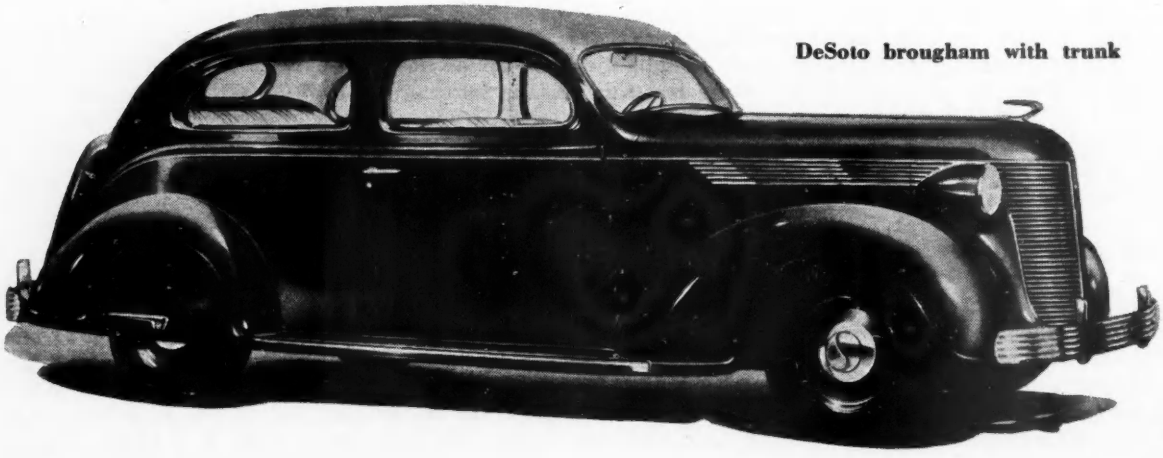
How the metal floors of DeSoto bodies are "sound-proofed."

Insulation of the body has been improved. A heavy insulant, impregnated with asphalt, is used under the steel roof and on the upper rear quarter and cowl. Another grade of insulating material is bonded to the steel floor when it passes through the paint-drying ovens.

New-type body mountings, direct-double-acting hydraulic shock absorbers, an improved steering hook-up, a new ride stabilizer and a forward shift of the seats combine to improve the riding qualities. Body-mounting brackets are riveted to the frame, and the body is bolted to these brackets, but rubber insulators prevent metal-to-metal contact. The body bolt is also rubber-insulated. A steel spacer is incorporated in the mounting so that the bolts can be tightened only to a predetermined degree. This type of body mounting is intended to prevent road noises from being transmitted from the frame to the body.

The direct-type of shock absorbers are insulated from both the springs and the frame by rubber bushings. A large volume of oil and large valves keep down the working pressure. By mounting the shock absorbers at an angle, they help to control side sway. A new ride stabilizer is mounted at the front end, by rubber bushings and washers and steel brackets, to the under side of the frame and connects by links to the front spring seats on the lower control arms of the independent suspension units. It is independent of the shock absorbers. A pantograph type of independent front suspension is used.

There are individual tie rods between the steering arm (or pitman) and the

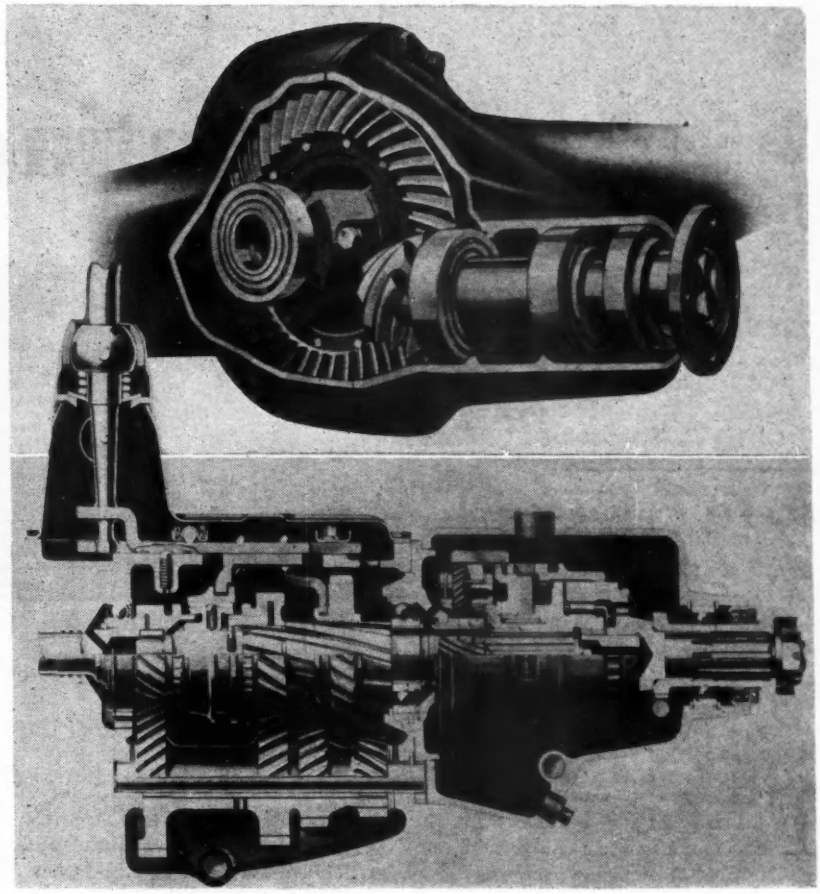


DeSoto brougham with trunk

knuckle arms. Tie-rod connectors are sealed with leather to keep out dirt and moisture. The knuckle-pin angle has been reduced from 9 to 4½ deg. to render steering easier. Front-wheel spindles have been increased in diameter, and larger inner wheel bearings are used. A worm-and-roller-tooth steering gear, with a ratio of 18.2, is used. The steering-wheel diameter has been increased from 17 to 18 in. The rear-wheel tread has been increased to 60 in. To obtain a better weight distribution, both the engine and the seats were moved forward.

All of the safety features which were described in connection with the Dodge line are incorporated also in the new DeSotos.

Front seats, which now measure 47 in. across, are wider and now accommodate three adults comfortably. These seats may be moved 2 in. forward and back from their normal central position. The width of the back seat has been increased to 48½ in., and additional leg room is provided by a foot rest recessed into the back of the front seat. These increases in seat width and leg room were made possible by increasing the length of the bodies 4 in. and the width at the cowl 3¼ in. Lower floors give more head room. The ventilating windshield measures 43 in. across and is controlled by a folding-type regulator. "Butterfly" ventilating wings,



(Top)—Mounting of the stem pinion of the hypoid rear-axle gears.

(Bottom)—Sectional view of the Syncro-Silent transmission with the (extra) overdrive

e Mark the New DeSoto Line

mounted on friction pivots, are built into the forward section of front-door windows. They swing in a wide arc and scoop air into the front compartment when it is desired. The rear section of the front-door windows lowers completely out of sight. Rear-section "butterfly" windows also swing wide to provide the proper ventilation.

Engines have the same bore (3⅜ in.) but ¼ in. less stroke (4¼ in.) than last year, and the piston displacement is now 228 cu. in. The standard compression ratio has been increased to 6.5 and the engine rates 93 hp. at 3600 r.p.m. An aluminum cylinder head with a compression ratio of 7 is available. New engine features include larger valves, improved porting, symmetrical connecting rods, U-slot aluminum-alloy "anodized" pistons with four rings, austenitic-steel exhaust valves, an improved oil filter, an air filter with removable filter element, and self-locking tappet-adjustment screws.

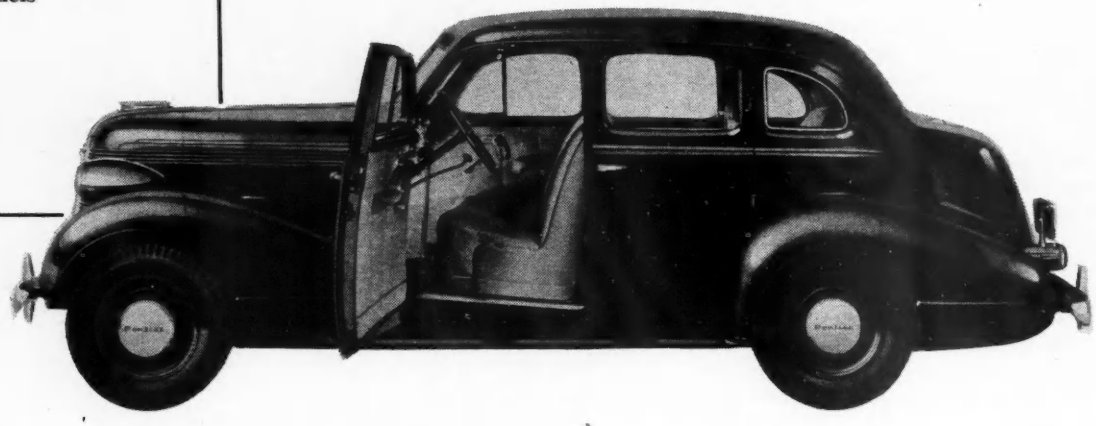
The fan-cooled generator is of larger capacity. There is a ball release bearing with a new Oilite ball retainer on the 10-in. clutch. The bearing is "prelubricated" and requires no lubricating attention in service.

An overdrive is available and when supplied is in a separate case at the rear of the transmission. There is then a ball bearing between the two units, which provides better support for the main shaft. The overdrive engages automatically at between 35 and 40 m.p.h. The "Syncro-silent" transmission, with all helical gears, has been improved to make shifting easier and operation quieter. It now has a roller on the second-speed shifting rail, and there are six anti-friction bearings in the transmission.

The new hypoid rear axle lowers the propeller shaft and allows a low and

(Turn to page 583, please)

Pontiac Increases



Pontiac DeLuxe sedan, showing doors of increased width. The wheelbase has been increased to 122 in. and the roof is lower than on last year's models

TWO lines—a Deluxe Six and a Deluxe Eight — constitute the Pontiac offering for the 1937 season. New all-steel bodies, roomier, lower, and more pleasing in appearance; longer wheelbases, an entirely new frame, and increased power and economy are outstanding features of the new line. Last year's Master Six with conventional springing has been dropped.

Among the new chassis features are a link-parallelogram front suspension with coil springs, replacing the Dubonnet system used during the last two years; and lower frame and lower floor levels, rendered possible by making the propeller shaft in two sections and substituting the Hotchkiss for the torque-tube drive, which latter has been a Pontiac feature for many years.

The wheelbase has been increased 5 in. in each line—to 117 in. in the Six and 122 in. in the Eight. Roofs are 67 in. high, a decrease of 1 in. Both lines will comprise seven body types, viz., a business coupe, sport coupe, cabriolet, two-door sedan, two-door touring sedan, four-door sedan and four-door touring sedan. However, the two-door and four-door sedans of the eight-cylinder line will be built on order only. These fourteen bodies will be available in seven colors, with striping that provides a harmonizing contrast. Basic colors are black, blue, brown, gray, green, maroon, and cream. By increasing the wheelbases it has been made possible to shift the rear seat forward 6 in. with respect to the rear axle, thus increasing riding comfort. The estimated curb weight of the four-door sedan is 3375 lb. for the Six, and 3525 lb. for the Eight.

The silverstreak radiator-and-hood grilles are retained in slightly modified form. They are narrower and consist of a wide center bar separating six narrower bars. Flanking the vertical chrome-plated grille on both sides of the radiator shell are five groups of equally-spaced, horizontal, chromium-plated bars which follow the contour of the shell and form the radiator side grilles.

By Joseph Geschelin

Headlamps are longer and set lower on the fenders, which latter hug the hood and radiator more closely, and slightly overlap the lower portion of the radiator shell. The lower inside portion of the front fender skirts has a raised-panel effect. The hood line is higher—the radiator narrower. Fenders have a split-pear shape, with horizontal windsplit beads. The rubber-covered running boards join the front, but not the rear fenders. Steel wheels have large, shallow, chromium-plated hub caps and carry 6.00-16 tires on the Six and 6.50-16 tires on the Eight.

While the basic engine features adopted last year are retained, the 1937 engines have increased displacement. The Six has L-head, 3 7/16 by 4 in. cylinders (222.7 cu. in. displacement) and is rated 85 hp. at 3600 r.p.m., with a compression ratio of 6.2 and cast-iron heads. The Eight has L-head, 3¼ by 3¾-in. cylinders (248.9 cu. in.) and is rated 100 hp. at 3800 r.p.m., with a compression ratio of 6.2 and cast-iron heads.

Crankshafts are now completely counter-weighted, and statically and dynamically balanced. There are four main bearings on the six-throw shaft and five on the eight-throw. The new rifle-drilled connecting rods have interchangeable steel-back, white-metal bearings. Pistons are of chrome-nickel alloy iron. Two grooved compression rings are installed above the piston pin and there is one oil-control ring below the pin. Piston skirts are tin-plated and the pistons are given a close fit in the cylinders.

An improved three-point mounting has been developed for the engine. At the front it is supported on the center line below the crankshaft; rear mountings are on opposite sides of the clutch housing.

To allow for the greater heat rejection due to increased piston displacement, the capacity of the cooling system has been increased. The fan diameter is now 17⅞ instead of 16 in. and the diameter of the pump impeller was increased from 3¼ to 3⅜ in., but the speed of the pump was lowered practically 30 per cent, the present pump making 3030 r.p.m. at 60 m.p.h. car speed. The front bushing used in the pump last year has been replaced by a roller bearing sealed at both ends.

A different type of valve-spring retainer is used. The lower end of the

Displacements, Wheelbases

valve stem is surrounded by a split collar with conical outer surface and two interior circumferential ridges which engage into grooves on the stem, the collar being held together and in place by the spring washer, which has a corresponding tapered bore.

The four pins in the harmonic balancer, against which the springs of the balancer weights bear, have been increased in diameter to reduce the stress to which the springs are subjected at the middle of their length.

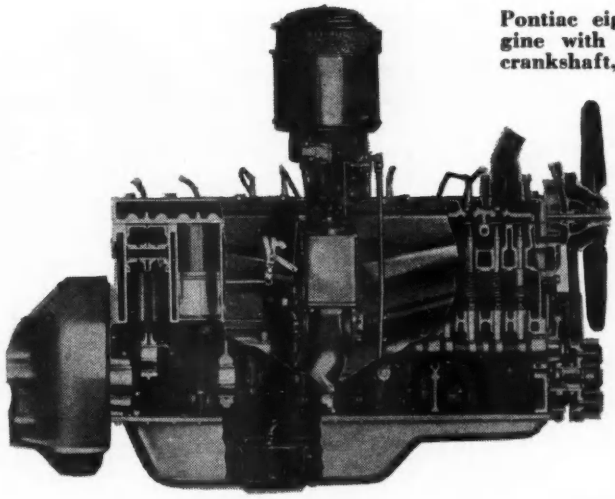
Manifolding is of the downdraft type. The thin-steel-tube riser in the inlet manifold, which provides a quick warm-up, is continued. Automatic heat control is provided, and the thermostatic spring may be adjusted for three conditions of atmospheric temperature —cold, hot and extremely hot. Both engines have four intake ports, but there is a separate exhaust port for each cylinder in each of the blocks.

Other features, such as full-length water jackets, full-pressure, metered-flow lubrication, gusher valve cooling, etc., are continued. The carburetor is a 1¼-in. Carter downdraft, with triple venturi air intake, pneumatic accelerating pump, economizer, and an anti-percolating device. The Carter automatic choke is built into the carburetor.

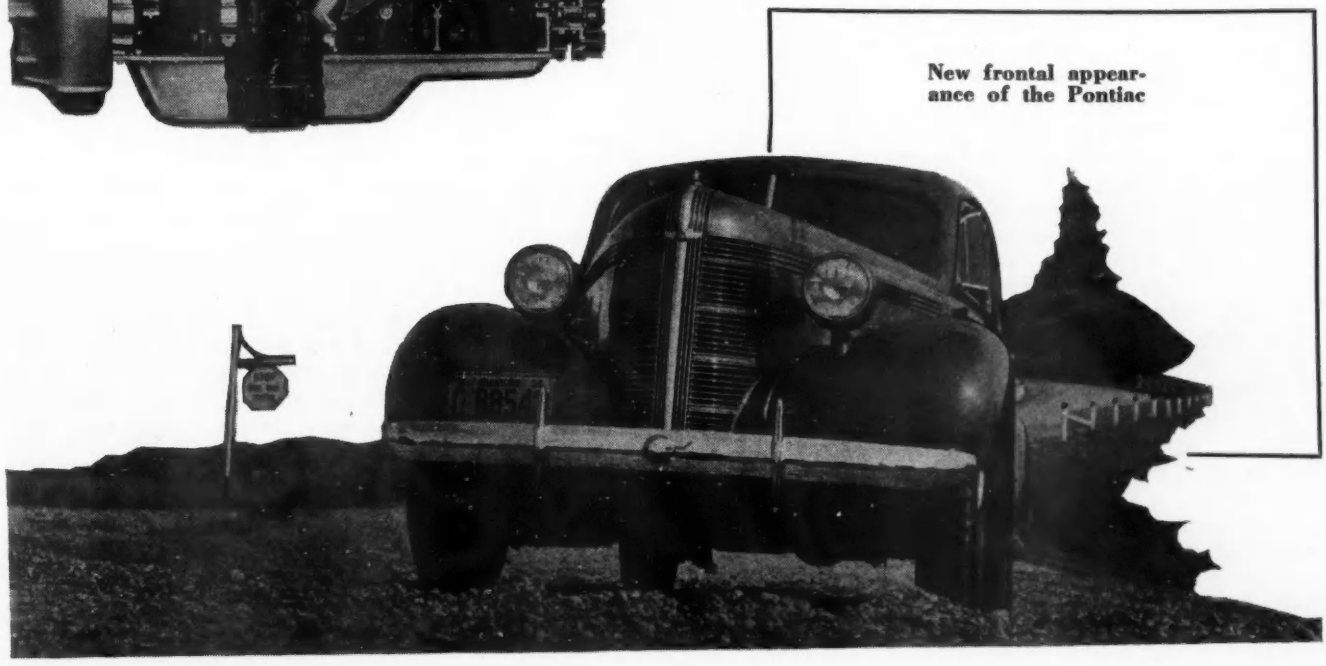
The crankcase ventilator is of the combination pressure-suction type, in which the oil filter serves as the ventilator inlet. A trap in the rear valve cover prevents loss of oil at high speeds.

For dusty regions, Pontiac offers an oil-wetted air cleaner and silencer and a special ventilator inlet at extra cost. Another available extra is a fuel pump with vacuum booster, which latter improves the operation of the windshield wiper.

The most significant changes have been made in the chassis and running gear. The new frame has an X-member composed of I-section straight rails. Reference has been made already to the new front suspension, and the Pontiac is said to be the lowest-priced car on the American market this year having the linked-parallelogram front suspension with coil springs. The rate of the front springs has been reduced to 90 lb. per in. at the wheel center. Rear springs on sedan models have a rate of 126 lb. per in. The forged-steel arms of the double-acting shock absorbers form the upper spring support. By increasing the steering gear ratio from 17.5 to 19 and by adopting center control and cross steering, the effort required for steering is claimed to have been reduced and wheel fight eliminated. A number of improvements were made in the steering gear proper. The steer-



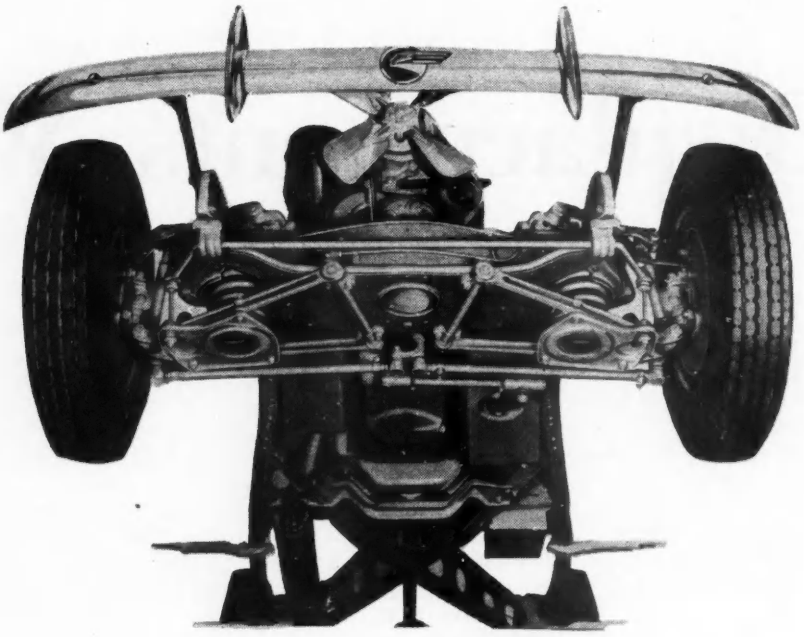
Pontiac eight-cylinder engine with fully balanced crankshaft, in part section



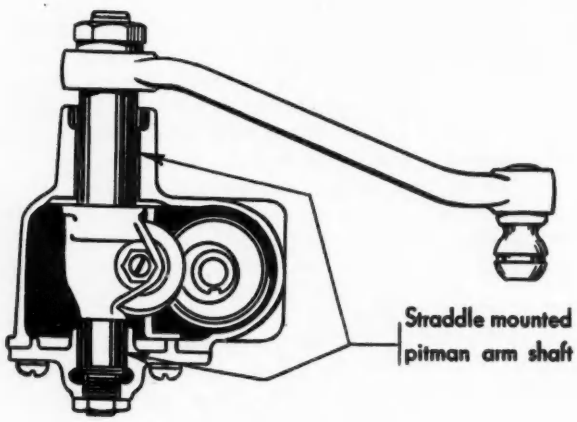
New frontal appearance of the Pontiac

ing-arm shaft is now straddle mounted, and adjustment of the steering gear for slack is made by means of a sector located on the bottom of the steering-gear housing.

Owing to the adoption of the Hotchkiss drive, the semi-floating axle had to be redesigned. Its housing is welded up of two stampings and has the cover for the center housing welded on, and the brake flanges are butt-welded to its ends. The differential carrier is a casting of chrome-nickel iron, with liberal ribs to insure rigidity. Differential side bearings are of the Hyatt barrel roller type. New-Departure ball bearings, which take the axle radial loads and wheel thrusts, are sealed and carry sufficient lubricant for the life of the car. New-Departure double-row ball bearings take thrust and radial load at the front of the drive pinion, while Hyatt solid roller bearings support the rear of the pinion gear. Pontiac coats the inside of the carrier and differential cases with a spray of Duco before machining, to seal in place any particles of dirt that may not have been shaken out in the foundry cleansing process.



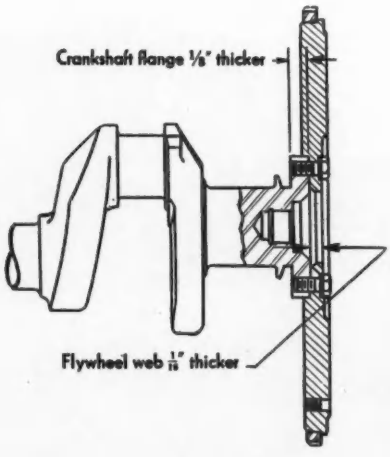
Front suspension and steering linkage



Straddle mounting of steering-arm shaft

Pontiac claims to be the first manufacturer to use a non-generated, straight-tooth ring gear operating with the conventional generated spiral bevel drive pinion. Ring gears and pinions are forged from nickel-molybdenum alloy steel. The standard gear ratio is 4.375 to 1. Optional ring gear and pinion sets for mountainous sections and extremely flat plain regions are 4.625 to 1, and 4.125 to 1, respectively. Rear-axle drive ratios have been reduced from 4.44 on the Six and 4.55 on the Eight.

The forward section of the dual propeller shaft is integral with and supported by the transmission. A short, easily-balanced rear section, with roller-bearing universal joints at both ends, connects the front section to the rear axle. A sliding coupling at the rear of the transmission obviates the need for a slip joint in one of the universals. With this construction the swinging part of the propeller shaft is relatively short and located entirely under the body kick-up, where no tunnel is required to assure propeller-shaft clearance. Two distinct advantages are claimed for this feature: By making the front section integral with the powerplant, its rear end does not have to be supported by the chassis frame, and one potential source of vibration and noise is thus eliminated. Secondly, the problem of balancing the propeller shaft is greatly simplified.



More secure flywheel fastening

Two-shoe, duo-servo, triple-sealed hydraulic brakes are continued. The brake diameter is 12 in., the width of the lining, 1¾ in., and the area of the friction surface, 161 sq. in. The brake lever is located under the cowl, to the driver's left, and connects to the two rear service brakes by braided steel cables. Improved steel brake drums with cast-iron braking surfaces are machined to tolerances of 0.004-0.005 in. for concentricity.

Two-way, direct-acting rear shock absorbers are connected to the frame and the rear springs with large, rubber-insulated bushings.

Fisher bodies for Pontiac are of all-steel construction, with turret top. Front seats are 2 in. wider, being 52½ in. wide, while rear seats have been widened 1¼ in. Adoption of the Hotchkiss drive has permitted lowering the chassis 2½ in. and the floor 3 in. without resorting to the use of a tunnel. However, the floor is "crowned," sloping slightly from the center down to the sides.

Door openings have been made wider and front-door openings are 1½ in. higher. Rear-door openings are 3 in. higher and 5 in. wider at the floor level. Visibility has been improved by making the windshield 2 in. wider and higher and increasing its rake angle from 31 to 39 deg. Coupe seat backs and two-door sedan front seat backs no longer are of the bucket type, but are continuous across the car, with a split in the center and hinged to permit access to the rear compartment.

Tilting is a feature of the front-seat adjustment. Besides the 4-in. horizontal adjustment, the whole seat becomes more nearly vertical as it is pulled forward, thus raising a short person to a more nearly upright position. When the seat is pushed back, it takes a more reclining position, suitable for the person of more than average height. The wider rear doors make it possible to lower the rear-door windows out of sight, an added safety factor as well as a convenience in passing articles. A narrow drip molding has been added to protect both front and rear doors in wet weather. A second wind seal has been provided in the form of a continuous strip of sponge rubber molding between the door flanges and the outside of the door openings. This is in addition to the wind lacing.

The new crowned instrument board has a burled walnut finish. The chromium-bound instrument panel on the left balances the glove locker door on the right. In the center between the two are the ignition switch, throttle and light controls, and spaces for radio controls and an electric clock. A "three-passenger gear shift lever," intended to eliminate any crowding of driver or middle passenger, when three are carried in the front seat, is offered as an extra. It is an inverted "L" consisting of a lever projecting vertically from the transmission, with a parallel rod pivoted at both ends and a horizontal gear shift rod which carries the knob.

Dual windshield wipers are pivoted at the base of the windshield. Provision is made for a built-in windshield defroster, which takes its heat through flexible tubes from a small rotary blower located on top of the hot-water heater. The foot-type dimmer combines with the light switch to control the improved multi-beam driving and passing headlights. Well-padded arm rests in front and rear, an ash receiver in the center back of the front seat, assist cords in four-door models, a central dome light, a thick carpet harmonizing with the upholstery in the rear compartment and ribbed thick rubber matting in front, together with conveniently located door handles and window cranks, complete the interior.

New hot-water heaters are located in the center of the dash, instead of at one side, and have doors which may be adjusted to throw most of the heat into the rear compartment, or, alternately, to direct it toward the front-seat occupants.

Spark plugs are of the AC 14-mm. type. The Delco-Remy distributor has vacuum control, and provision for quick adjustment of the spark advance to suit fuel and driving conditions. The Delco-Remy generator is of the ventilated type, with voltage control and a high charging rate. The Six carries a 15-plate battery rated 94 amp-hrs., the Eight a 17-plate battery rated 107 amp-hrs.

Multi-beam headlamps with assymetric beams and with longer, streamlined shells are new, and are finished to match the sheet metal of the car. Two-filament bulbs, rated 21-32 cp., are used.

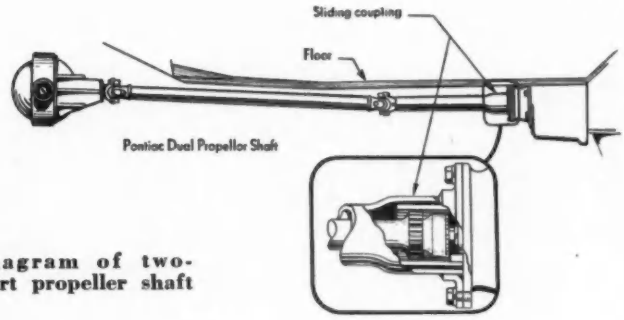
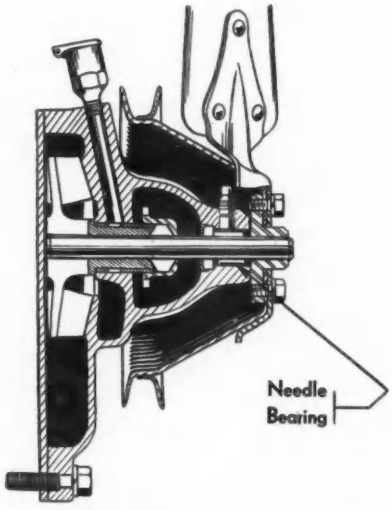


Diagram of two-part propeller shaft



Needle bearing on pump-and-fan shaft

Comfort and Style Mark the New De Soto

(Continued from page 579)

level floor in the rear compartment. The standard rear-axle ratio is 4.1. With overdrive a ratio of 4.3 is used, which gives a final-drive ratio of 3.11 in overdrive. Taper roller bearings are used throughout the rear axle.

The hydraulic brakes have stepped wheel cylinders designed to give equal lining wear on both shoes. Centrifuse brake drums with cast-iron friction surfaces are continued. The hand brake acts on a cast-iron drum on the propeller shaft.

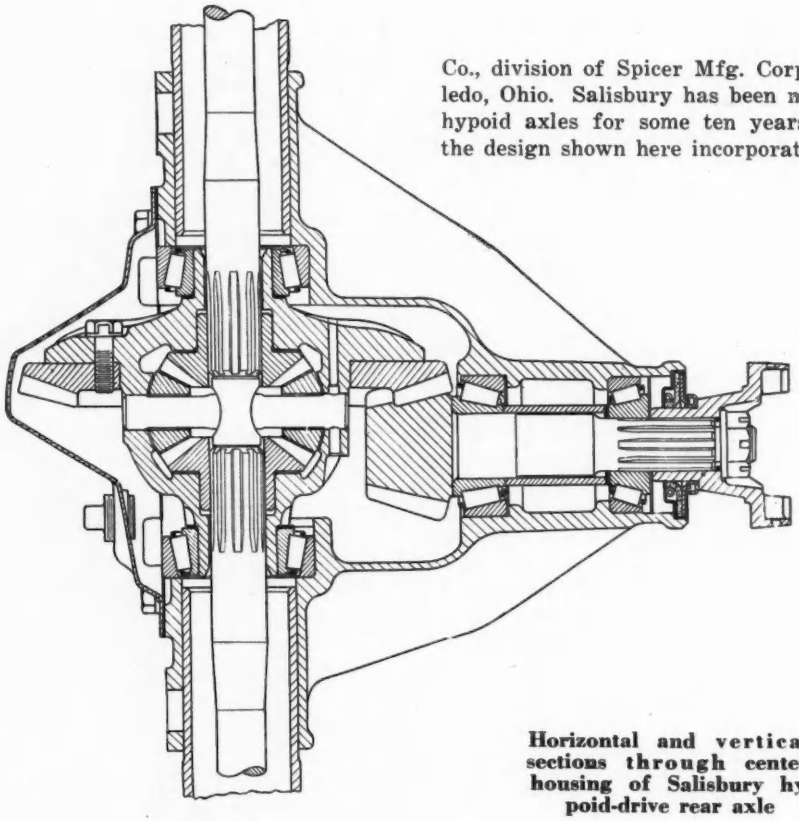
The center section of the X-type frame has been provided with rolled edges to make it stronger, and there are now braces between the side rails and the X-member. The rear running-board supports extend through from the side rail to the X member. All bodies, fenders and other sheet-metal parts are rust-proofed before painting.

Foot rests recessed into the back of the front seats

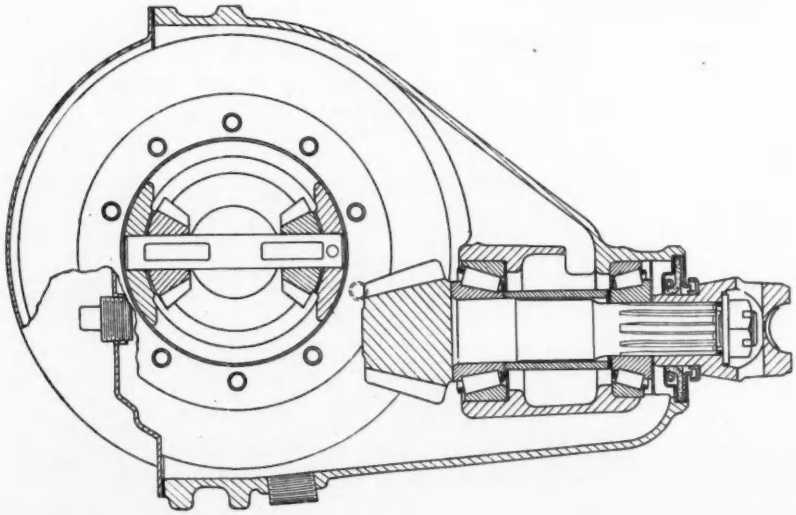
Hypoid Rear Axle

for 1937 cars developed by Salisbury Axle Co.

A NEW hypoid rear axle, developed for one of the car manufacturers for 1937, is being produced by the Salisbury Axle Co., division of Spicer Mfg. Corp., Toledo, Ohio. Salisbury has been making hypoid axles for some ten years, and the design shown here incorporates the lessons learned during this period.



Horizontal and vertical sections through center housing of Salisbury hypoid-drive rear axle



Experience is said to indicate that the hypoid axle is somewhat more quiet than the conventional spiral bevel gear drive, provided the gear set is accurately aligned and the mountings are sufficiently rigid. Rigidity of mounting is essential not only to achieve quietness but to assure full tooth contact, so as to hold tooth pressure within reasonable limits.

In the Salisbury construction, the axle housing is ribbed to assure rigidity in all directions. To afford the necessary rigidity for gear alignment, the differential bearings are supported entirely by the axle housing, instead of by overhanging pedestals, as has been customary.

The new hypoid axle follows the patented construction which has been used by Salisbury for some years. Since most engineers are familiar with the patended design, suffice it to say that an important feature of the axle is that of shim adjustable bearing mountings at all points. The usual threaded adjustment features are absent, the various elements being set up in accurate alignment by means of shims and locked in place. Suitable fixtures and gages are provided to enable the assemblers to determine the amount of shims necessary to produce the standard back lash and preload requirements.

It is interesting to note, too, that at assembly the bearings are pressed in with a certain degree of preloading so as to eliminate all possible elements of deflection beyond allowable limits. A special type of E-P lube is recommended for lubrication.

It is claimed that over a period of years it has been unnecessary to make further adjustments in the field, although the required gages and service fixtures have been made available for the purpose.

The Horizons of Business

By Joseph Stagg Lawrence

Casting Stones

DETROIT, it seems, is one of those chronically annoying places. It suffers from that discontent which the bards call divine. Never satisfied to let well enough alone it has been the bellwether of recovery and has produced more cars this year than in any year of its history excepting only 1929. The great plants of the city have for some weeks been witnessing the installation of added ingenious equipment designed to produce more cars, better cars, cheaper cars, cars which in terms of human effort cost less than any other essential satisfaction. Detroit is the finest flower of the machine age.

The End of a Beautiful Friendship

It would seem that with all these accomplishments to its credit it would rest on its laurels or at any rate keep quiet during these last tense days before the election. Understand therefore, the irritation of New Dealers who find Detroit manufacturers sending their employees pay envelopes which contain a modest explanation of the Social Security Act. The irritation commingles with consternation when it is discovered that many of these employees after grasping for the first time the significance of this statute in terms of their own pay envelopes tear the Roosevelt stickers from their windshields. Major Berry, the chief of Labor's Non Partisan League which is most partisanly engaged in cudgeling organized labor to vote for Roosevelt is magnificent in his indignation. He is joined by Senator Joseph Guffey whose pious political spirit is shocked by the educational efforts of the Detroit employers — particularly in view of the fact that Pennsylvania manufacturers are following suit.

The Lament

Governor George H. Earle of the Keystone State charges that these pay envelope messages contain "half truths and deliberate falsehoods about the Social Security Act."—that these activities of the manufacturers are a "conspiracy to prevent the effective workings of a statute of the United States."

In view of the acute distress of these and other eminent citizens all of whom, peculiarly enough, are identified with the Democratic party it is necessary to examine the conduct which appears to be such a reprehensible departure from true patriotism.

A Simple Statement

The message which appears on pay envelopes hardly justifies the epithets hurled by Messrs. Berry, Guffey, Earle, et al. at the individuals who distribute it. It is a plain statement that one per cent will be deducted from the pay envelops of the worker after the first of the year, that this deduction will increase until it equals 3 per cent, that the proceeds are to be used as benefit payments for the unemployed and pensions for the aged, that the government offers the worker no guarantee that he will receive such payments when he is unemployed and such pension when he passes the statutory age of usefulness —that the Roosevelt administration is responsible for the statute.

The attempt to question the accuracy of this statement or to brand its distribution as treasonable is fantastic. It adheres to the facts although patently it does not state all the facts. No one denies that the inspiration of the message is political and that it has been shrewdly timed to make it difficult for the opposition to catch up. The fact is that the statement in no part can be denied. To erase the impression which it makes on the worker—distinctly unfavorable—it is necessary to explain. The explanation must sell the social and economic philosophy of whose prolific offspring the social security act is but one. This is not the kind of an answer that will make much headway in the few days that remain before election. It is the perception of this difficulty rather than the obstruction of any statute which so stirs the indignation and fears of the New Dealers.

Possible Abuse

There is no denying that the use of the pay envelope to convey a message to the worker, political in character, may be abused. It is the most concentrated and effective advertising medium for reaching the worker. Employers conceivably might distort the facts. Instead of appealing to the reason of the worker they might fan his prejudice or use their own position as employers to threaten the jobs of their workers unless—. Such abuses are possible and the responsibility for them in part at least would rest upon the political group which originates the message.

Provocation

On the other hand such abuse may have great provocation. In this case the complaining party violates one of the elementary rules of justice. It cannot come into court with clean hands. The pious Trinity which is prepared to shoot the manufacturers of Pennsylvania for treason are in the position of highwaymen who come to court charging their neighbors with stealing property that originally belonged to the neighbors but was lifted in the course of professional duty by the plaintiffs. Messrs. Guffey, Earle and Berry have been appealing to workers to support Roosevelt on the ground that he is their proper champion. The ground may or may not be correct. As a result of this appeal in which Lewis, Dubinsky, Hillman and other powerful labor leaders participate the organized worker has been persuaded to align himself preponderantly with the Democratic party. Although this violates the traditional non-partisan position of organized labor and follows a most questionable appeal to class interest by the administration it had not, up to the time the message-bearing pay envelopes were distributed, been matched by any effective appeal from the other side.

Degrees of Reprehensibility

Of the two appeals, the one by labor leaders and New Dealers is infinitely more reprehensible than the appeal by the employer. The self interest of the employer discovers an affinity with the self interest of the worker and proceeds to exploit it. He does so without pressure or distortion. This is certainly one

(Turn to page 592, please)

Chrysler Line

FOR 1937 the Chrysler line of cars will again consist of four models, viz., the six-cylinder Royal with 116-in. wheelbase and 93-hp. engine; the eight-cylinder Imperial with 121-in. wheelbase and 110-hp. engine; the eight-cylinder Custom Imperial with 140-in. wheelbase and 130-hp. engine, and the eight-cylinder Airflow with 128-in. wheelbase and 130-hp. engine.

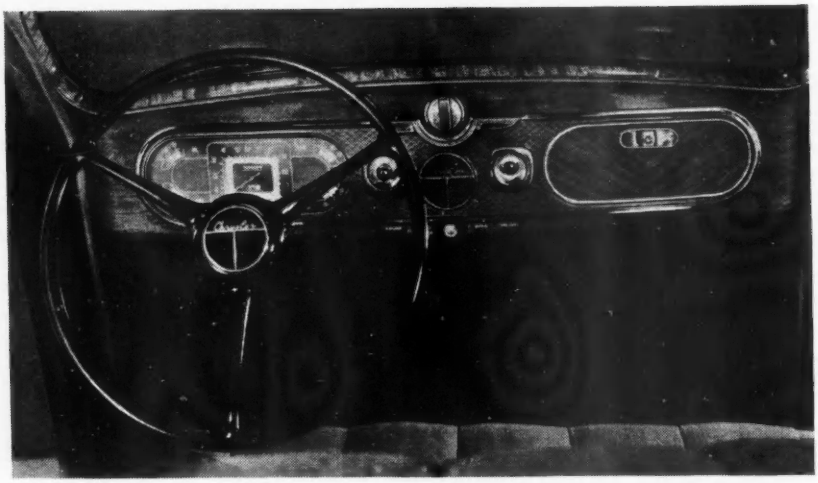
Ten body styles are offered on the Royal chassis, including a business coupe, rumble-seat coupe, convertible coupe, two-door touring sedan, four-door sedan, four-door touring sedan, convertible sedan, seven-passenger sedan, and limousine. The Imperial comes in six body styles. Business coupe, rumble-seat coupe, convertible coupe, two-door touring sedan, four-door touring sedan, and convertible sedan. Both the Custom Imperial and the Airflow come in two body types only, the former in a seven-passenger sedan and a sedan limousine, and the latter in a six-passenger sedan and a coupe.

The most important development in Chrysler policy is a material reduction in the price level of the Royal line, which thus definitely makes its entry into the low-priced field. This car has an engine of 228-cu. in. piston displacement, with a compression ratio of 6.5. Its valves have been redesigned and it now has exhaust valves of an austenitic steel which better resists heat and corrosive influences. Valve tappets have self-locking screws, so they do not require locking nuts and are easier to adjust to the proper valve clearances. U-slot type aluminum pistons have replaced the T-slot type. Connecting-rod bearings are symmetrical instead of being offset, and the central main bearing has been increased in length, which necessitated lengthening the engine block. The redesigned engine is said to be lighter than its predecessor, and to show a higher fuel economy.

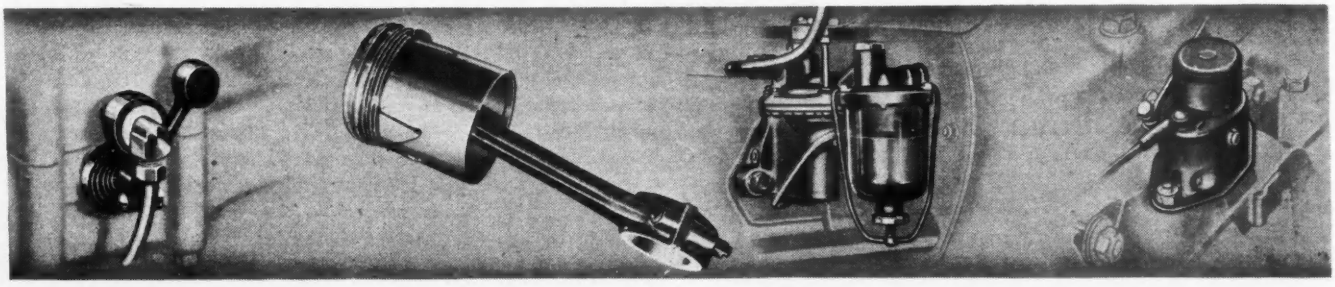
Bodies are wider than in the past, the front-seat width having been increased from 44 to 47 in. and the rear-seat width from 46 to 49 in. The body is also wider at the cowl, and this has permitted increasing the windshield width to 43¼ in., giving better vision. In the rear compartment the shaft tunnel has been eliminated consequent upon the adoption of hypoid-gear rear-axle drive. The compartment floor is 2⅜ in. longer and 4⅛ in. wider.

The new instrument panel has the instruments and accessories conveniently grouped and well illuminated. Every control is flush with the surface of the panel and all knobs and protuberances have been eliminated from both the outside and the inside of the car. As another move in the interest of safety, the instrument board has been raised so that it clears the knees of front-seat occupants.

Although the body still follows the contour of the frame, it is no longer mounted directly on the frame, but on short outriggers or brackets, which are riveted to the frame. The outriggers are insulated at both top and bottom, and also by a bushing through which

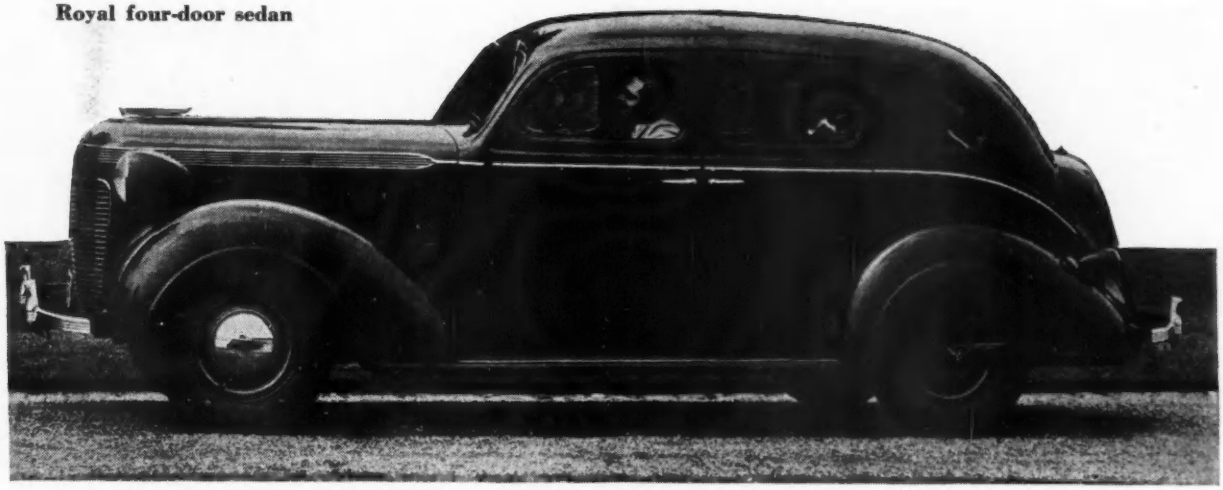


Instrument board with all projecting parts in recesses



(Left to right below) Automatic manifold heat control (Royal and Imperial); U-slot aluminum piston and symmetrical connecting rod; Fuel pump and strainer and Automatic choke

Royal four-door sedan



Revamped for Lower Prices

the bolt passes, by pure gum rubber. There is no possibility of metal contact between body and frame, hence noise cannot be transmitted from the frame to the body.

The center section of the X member of the frame has been improved to increase the rigidity of the frame as a whole, and a brace has been added between the X member and each of the side rails, tieing the X member and the side rails together more rigidly.

A changeover has been made to the ventilating type of windshield, while the large, screened cowl ventilator has been retained. Ventilating wings are built into the forward section of front-door windows. These can be swung outward and then serve as air scoops. The ventilating-wing section of the window is stationary, but the rear section, including the divider strip, can be lowered completely. Rear-quarter windows on the four-door sedan models swing outward on friction pivots in the same manner as the front-door ventilating wings. Rear-door windows lower completely out of sight, and rear-quarter windows on two-door sedan models lower almost flush with the sill.

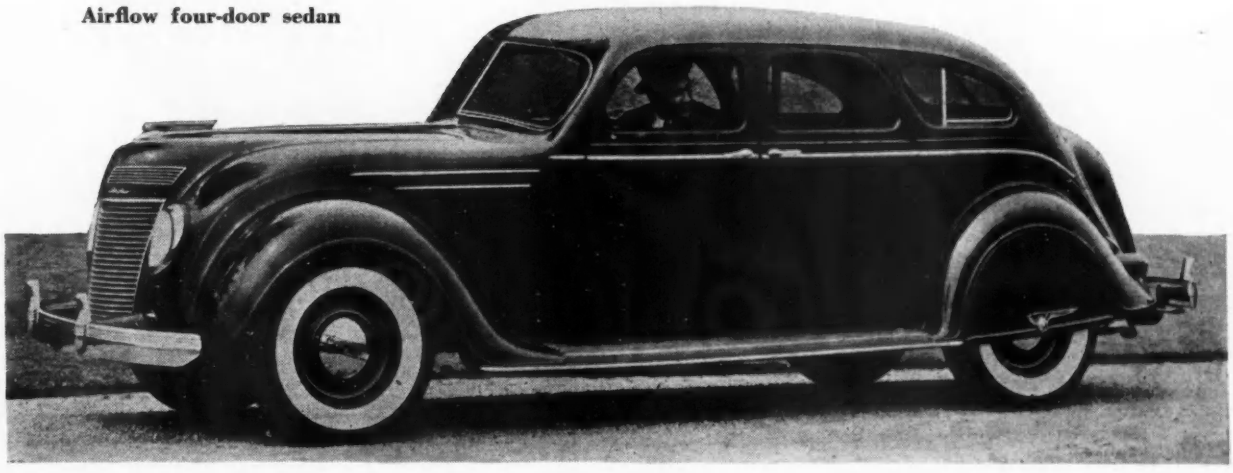
The rigidity of the car as a whole is increased by the manner in which the body is secured to the frame. It is fastened down at 18 points, 14 of these being on brackets and the remainder on the X-member.

The redistribution of weight, which was first featured on the Airflow and adopted on other Chrysler models last year, has been carried still further. In the 1937 Royal and Imperial the engine has been moved farther forward, thus increasing the cradled area between axles in which the passengers ride. A two-way telescope-type shock absorber has been adopted. Independent front-wheel suspension is continued, as are the ride stabilizer and the "Floating Power" engine mounting.

In appearance the Royal is entirely new. The hood rounds off gracefully to a tapering convex radiator grille with horizontal chromium-plated bars. The top of the hood, which is longer than in the previous model, is a single stamping. It is hinged at the rear and opens upward, the radiator ornament serving as a hood-lock control. Hood louvers, in a panel of finely drawn horizontal bars, flow rearward from a point close to the center of the front end of the hood.

Headlamps of new design, with larg-

Airflow four-door sedan



Aero-hydraulic shock absorbers on Royal and Imperial

er lenses, are supported from the sides of the radiator by streamlined brackets. There are no protruding parts, capable of producing air eddies, at the front of the car. Bumpers, both front and rear, are wider and deeper, with stronger brackets and attractive guards. Front fenders are wider and higher in the crown, with a lower dip in front and more flare at the rear. Disc wheels with large hub caps harmonize with the general design. A drip molding extends from the cowl to the rear-quarter panel above the doors. The streamlining of the windshield has been improved by providing a roll where it joins the roof.

Trunks are standard equipment on touring models. They are more spacious than before, as the gas-tank filler pipe has been removed, which permitted lowering the shell above the spare wheel. Sedan models not furnished with trunks have large luggage compartments which close flush with the rear panel.

The Chrysler Imperial has all of the new features described in the foregoing in connection with the Royal, and is larger, more luxurious, and more powerful than last year, according to the manufacturer. Its eight-cylinder, 110-hp. engine has a piston displacement of 273.8 cu. in. and works with a compression ratio of 6.7. The windshield is wider, and bodies are roomier, the rear-seat cushion being 48½ in. wide and the front-seat cushion 47 in.—a considerable increase over last year's De Luxe Eight.

We now come to the largest and most luxurious model of the Chrysler line, the Custom Imperial, which is furnished with one or the other of two seven-passenger body styles. In the sedan-limousine the front compartment is separated off by a glass partition, which may be completely lowered if desired, making the car virtually a seven-passenger sedan. When it is chauffeur-driven, occupants of the rear compartment enjoy complete privacy.

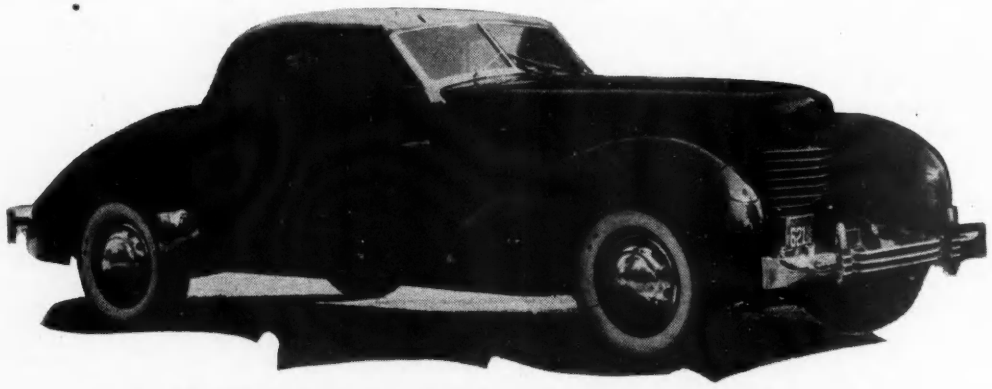
(*Turn to page 592, please*)

Chrysler Prices

Royal	
Bus. coupe	$715
Coupe, rumble seat	765
Touring broug'm, 2d.	785
Brougham, 2d	775
Touring sedan, 4d	825
Sedan, 4d	815
Imperial	
Bus. coupe	925
Coupe, rumble seat.	965
Tour. brougham, 2d.	965
Tour. sedan, 4d.	995
Airflow	
Sedan, 4d	1475
Coupe	1475

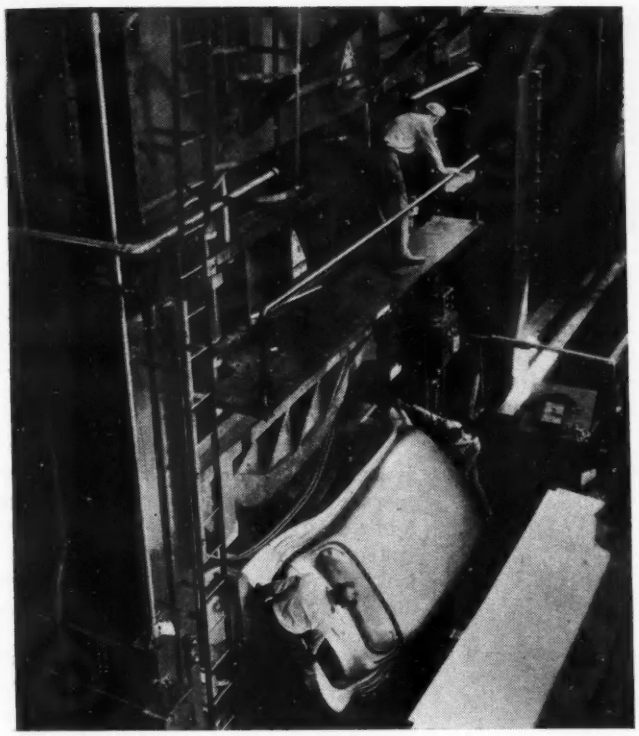
Prices quoted include safety glass equipment in all models and body styles, offered as standard equipment for the first time.

Cord Front Drive Offered with Choice of Engine



The Convertible Coupe above has a large luggage compartment. Top when lowered completely disappears into a compartment. It has a 125-inch wheelbase and powered with a 125 hp. Lycoming V-8 motor.

THIS year the Cord front-drive car is being offered with either an atmospheric-induction engine of 125 hp. or a supercharged engine of 170 hp. The engines, which are otherwise identical, are of the 8-cylinder V type. The Cord is this year available in three models on the regular 125 in. wheelbase chassis, namely, the Westchester five-passenger sedan, the five-passenger phaeton sedan with disappearing top, and the Sportsman's coupe with disappearing top and extra large luggage compartment. The company also offers an owner-chauffeur-driven Berline on a 132 in. wheelbase.



Production Lines

A brand new battery of presses, exerting the tremendous pressure of 3,000,000 pounds have been installed to turn out the new one-piece "Seamless Steel" tops for the new De Soto. These are thought to be the largest tops in the industry. The above picture shows one of the new tops coming out of the press. Sheets of steel 12½ feet long by 6 feet wide, used to press this roof which extends from the cowl way back to the rear trunk opening, may be seen in the picture next to the workman.

Tough Pressing

We are quite sure that one of the new cars we previewed recently supplied no end of headaches for the press shop crew. From a publicity point of view, this car has what is termed a "speed line" at the front end. To the shop it's probably something else again. The speed line is a sharp crease running downward from the hood side through the lower section of the front door. This requires an appreciable bulge in the door front panel with sharp corners at the point of maximum stretching. Figure it out for yourself and give the boys a big hand.

Paint Changes

It's a far cry from the scene of the Spanish civil war to the Detroit auto industry. Yet it caused quite a bit of trouble here recently. It seems that certain undercoats for body finish have been prepared with oxides procured from Spain and paint shop procedure has been based upon the characteristics of this type of finish. Came a halt to the supply of the Spanish product. So, a domestic material was substituted but apparently without warning the users. When the domestic undercoat was treated according to the usual procedure, it developed a hard, flinty coating that resisted all efforts to cut or rub. From that point on, it didn't take very long to find out that all it needed was a lower baking temperature and now everybody is happy again.

Cylinder Wear

Harold Andrews of Birmingham, Eng., well known for their activity in the field of cylinder liners, Stellite-faced valve seats and valves, have just issued an interesting brochure on the subject of cylinder wear. For your information they have collated some of the recognized theories on the subject, with particular emphasis on those which seem to have stood the test of experiment. To meet the problem of cylinder corrosion, this organization has produced a cylinder liner of a nickel-copper-chromium, austenitic alloy. If you want to compare notes, we shall be glad to get you a copy of this bulletin.

Stainless Trim

For 1937 we find a considerable increase in the utilization of modified stainless steel alloys for trim purposes. This bright, enduring material is being used for body moldings, louvre and radiator trim, and running board molding. One of the largest areas will be found on the Hudson radiator grille, in which the entire center section is made up of this stainless alloy strip.

Dual Control

Taking a leaf from the familiar radio, Lincoln "shielded-arc SAE" welders now are provided with a panel control which is said to greatly improve welding technique. Dual welding control is designed to produce the right type and size of arc to suit every welding job. For a complete explanation of how this is accomplished ask us for a copy of a new bulletin entitled, "The new arc welding technique."

Layout Fluid

A new type of coloring material designed to facilitate layout work for general machine shop and tool room use is now available. Instead of using the old copper sulfate etching method, you just brush on a nice blue coating that dries instantly. It may be applied on all metals including stainless steel, aluminum, brass, etc. With this fluid it is said to be unnecessary to polish or otherwise prepare the surface. Just wipe clean and then brush on.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

DIE STEELS

For Cold Work:—
NON SHRINKABLE
COLONIAL 6
RED STAR TUNGSTEN
CROCAR
O-HI-O DIE

For Hot Work:—
MARVEL
COLONIAL 3
CHOICE
HOTFORM
EXTRUDE DIE

CUTTING STEELS

RED CUT SUPERIOR
E. V. M.
RED CUT COBALT
GRAY CUT COBALT

Keep your stock up to avoid production delays

VANADIUM-
ALLOYS STEEL CO. LATROBE, PA.

London Show

(Continued from page 577)

center of the front axle and one at each side of the rear axle. In 1935, Morris adopted and still fits the Jackall hydraulic system, which embodies a pump under the front floor operated by a detachable rocking lever and controlled by a valve that enables either both front or both rear wheels, or all four, to be raised simultaneously by means of four rams bolted to the axles. Wolseley and certain other makers have followed suit since then.

D.W.S. now has produced a similar hydraulic system with either a hand-operated or an engine-operated pump. Additionally, D.W.S. has another new system consisting of a "loose" hydraulic jack with a detachable pump handle, the pillar having a hinged arm which, when projecting at approximately a right angle, pushes into any one of four sockets integral with the four corners of the chassis frame and standing clear of obstructions; this is known as "four corner" jacking. Then there is the Stevenson system, comprising a loose screw jack, with hand brace or ratchet lever operation, that engages with either of two sockets, one on each side of the car under the outer edge of the running board; this lifts one front and one rear wheel simultaneously.

Another new jacking system is the Lake & Elliott "hydro-electric." There are four hydraulic lifting rams, two for each axle, and a rotary pump with an electric drive from the starting motor, the shaft of which can be coupled by means of a clutch to the pump shaft, giving a direct axial drive.

All British cars have "safety" glass for the windshield, and the majority have it for all windows as well. Safety glass windshields will, in fact, be compulsory by law after the end of this year, for old cars as well as new ones.

Accommodation for light luggage is now generally provided within the body shell. The tail locker may have access by lifting the hinged squab of the rear seat or by an exterior door with top or bottom hinge. When a bottom hinge is used the locker door when open can be used as a platform for additional luggage.

These hinge-down locker doors also serve other purposes in a few cases. Thus, on Rover cars the drop-door is thick enough to enclose the spare wheel recessed inside and covered by the floor forming the luggage platform. The door has balanced hinging to reduce the weight to be supported or lifted when it is being opened or closed respectively. Then, on the S.S. cars the tools are individually recessed on the inside of the locker door, covered normally by a

hinged floor that forms the luggage platform.

With few exceptions, all British sedans and coupés have a sliding roof section; a new feature in some cases is that the sliding section as well as the remainder of the roof is of steel and when closed is flush with the roof line.

The all-steel construction is all but universal for other than custom-built bodies, while one maker of the latter (Park, Ward & Co. who builds many bodies for Rolls-Royce and other super-grade chassis) has devised an all-steel construction said to be worth while for bodies built in small numbers.

Doors are generally hinged to the center pillar on either side, and a new type of hinge used by a few makers (Armstrong Siddeley for instance) enables each door to be opened through almost 180 deg., flat back against the closed door in front or behind. Provision is made to prevent the two doors on either side hitting one another. This arrangement makes the whole of the door aperture available for entry and exit.

Running-boards have almost disappeared from small and medium-sized cars, but are still retained to some extent on the larger models. Wolseley, in introducing an additional body style known as the "salon de ville" for the 25 hp. six-cylinder chassis, has given the latter a track of 61 in. at the rear, instead of the 56 in. of the same chassis for other body styles. Even with this 61 in. track, however, the rear cushion is only 46 in. wide and the elbow width 55 in.; the rear fenders therefore extend appreciably beyond the outside rear-quarter paneling.

Tubular framing for the front seats is now extensively used; the seats generally are separate and separately adjustable. When full-width front seats are used there may be a central folding armrest and adjustable armrests on the front doors.

Armstrong Siddeley has a new body termed the "town and country" saloon; the normal front seat has a folding glass division attached to it and this can be folded into a recess in the back of the front seat where it may be hidden by a folding table for the rear passengers.

The "pillarless" sedan has made no headway, and all bodies except the very smallest and a few coupés have four doors.

"No-draught" ventilation has gone no farther than butterfly panels for the front doors and/or front-hinged quarter lights. The writer has tested a pressure system consisting of an air-scoop above the roof with a series of concentric shallow cones through which the air enters the interior and spreads almost horizontally in all directions above head level; though quite effective in conditioning the atmosphere inside the body, even with all doors and windows shut tight, and with no sign of draught, this scheme has not been adopted except for buses, possibly owing to the difficulty of providing an exterior scoop that shall not be an excrescence above the roof line.

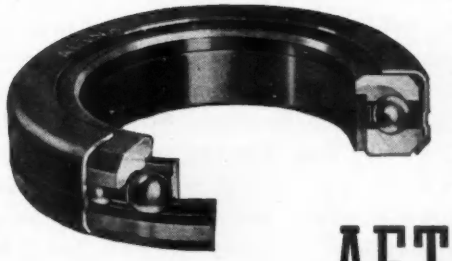
There is a slight improvement in driving visibility from large cars evident at Olympia, but not much, while even some of the smaller sizes still do not give the driver a wide or close enough view of the road ahead. Lanchester in planning a new Fourteen-Six has been at some pains, however, to enable the driver to see both front fenders at once without leaning forward or to either side; but such forethought in the interests of safety is still cause for remark, and there has been no attempt yet to provide seats adjustable for height as well as for leg reach, though a tilting front seat is used by Alvis.

Like American manufacturers, those in England are using various substances on metal panels to prevent drumming in all-steel bodies, and one in particular (Austin) makes a great point of "silent bodywork."

MODERN motorists often drive their cars 25,000 miles before they even unpack their tool kits, but when Uncle John and Cousin Kate "bit the dust" for 25 miles, without once getting out and getting under, it was something of a motoring miracle.

This amazing transformation in motor car efficiency has been due mainly to the industry's forward looking attitude and alert acceptance of worthy improvements.

Take the history, for instance, of Aetna's "T" Type Clutch Release Bearing. Because it is self-lubricated "for life," designed to prevent escape of lubricant to clutch facings and to permanently abolish eccentric thrust (trouble's principal source), this superior bearing was quickly and unhesitatingly adopted by practically all manufacturers of cars and trucks in the big-volume field. Today, its right to such industry-wide preference has been substantiated by time and millions of merciless miles of use under all conditions. Doesn't such a record counsel you to investigate?



AETNA
BALL BEARING MANUFACTURING CO.
4600 SCHUBERT AVE., CHICAGO, ILL. DETROIT OFFICE, 7310 WOODWARD AVE.

Chrysler Revamped

(*Continued from page 588*)

The rear seat of this car is 51½ in. wide, the front 49½ in. Auxiliary seats are of large dimensions. Both of the main seats accommodate six persons comfortably. The front seat is universally adjustable, that is, it can be tilted and be moved up or down, forward or back. Each of the two windshields and two cowl ventilators is separately controlled. Ventilating wings in the front doors may be completely lowered with the rear half of the window if desired. Pivoting rear-quarter windows allow rear-seat occupants to adjust ventilation individually. Windows in the rear doors of the sedan may be lowered completely.

An automatic overdrive is standard equipment on the Chrysler Airflow, and in conjunction with the high degree of streamlining is said to result in a fuel economy which is unusual for a car of this size and weight.

120 Ton Capacity

A TRUCK of 120 tons capacity has been built recently in Great Britain for a road hauling concern. It is no less than 74 ft. long and it cost nearly $50,000. Four men are required to operate it. A driver and brakeman are located at the front; at the center there is a man whose duty it is to keep the load properly centered over the seven axles, to which end he is provided with an hydraulic ram. At the rear there is a second driver who steers by the rear wheels. The two drivers' seats are connected by a loudspeaker installation. With a load of 120 tons the vehicle is limited to a maximum speed of 6.2 m.p.h. It has eight forward and two reverse speeds, and the lowest forward speed represents a reduction ratio of 140:1. The engine is a six-cylinder 180-hp. Diesel.

Under British road regulations the truck cannot be used for the transportation of "piece goods" and can haul indivisible loads only.—*Technique Moderne*, Sept. 15.

because it is
Built as only
"MECHANICS"
can build

For passenger cars, trucks and busses there is a Mechanics Roller Bearing Joint or Shaft Assembly that will meet every requirement. "Built as only 'Mechanics' can build" means more than a quarter-century of experience in the universal joint business—designing, manufacturing, inspecting, testing, servicing products of the highest quality. As a result, Mechanics Roller Bearing Universal Joints are simple, reliable, durable, and economical. All of their parts having any appreciable effect on balance are machined all over. Integral keys, instead of screws or bolts, transmit driving torque. Ample provision is made for easy lubrication. Assembly is simple. For the main drive, in steering gears, for driving air compressors, generators, fans—for every purpose that requires a universal joint "Make it a Mechanics Universal Joint". Investigate. Write, today, for complete information.

MECHANICS UNIVERSAL JOINT DIVISION
Borg-Warner Corp. 1301 18th AVE., ROCKFORD, ILLINOIS

Horizons of Business

(*Continued from page* 585)

of those inalienable privileges which the hoary Bill of Rights guarantees. It is difficult to see why politicians and labor leaders, both of whom have intensely selfish interests to serve thereby, should have the right to appeal to employees while the employers who take the risks, meet the payrolls and pay the taxes should not.

The Farley Example

It may be well to remind some of the apoplectic New Dealers that Mr. Farley has an effective organization which does things with employees of the government. An important distinction must be made. Mr. Farley neither pays nor finds the funds with which to pay these employees. Those funds come from taxpayers and the most important of these for revenue purposes are the private employers of labor. Mr. Farley wastes little time with these public servants. He and his minions tell them in explicit language how to vote. It is a blunt summons to interest and not an appeal to reason. The command to vote is accompanied by a demand for contributions proportioned to the income of the worker. Can you conceive the clamor if employers should direct their workers to vote for the Republican candidate, demand a contribution based on pay and load these demands with the threat of discharge? Yet the ethics of such procedure could be defended more easily than the brazen practice of the Farley organization in "using" those who have government jobs, PWA work or relief.